The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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For Chemistry and the Empire

MR. WOOLCOCK, who is organising the Chemistry Section of the British Empire Exhibition, took the interesting step last week of inviting the editors of a number of technical journals to meet him to discuss the arrangements. His experience of affairs had probably convinced him, as most public men are convinced, that the surest way of securing the loyal support of newspaper men is to take them fully into one's confidence, for very rarely indeed is such confidence abused. He found, as public men invariably do, that the editors were quite ready to co-operate with him, not only in order to secure information for their own journals, but in making the scope and objects of the Chemistry Section known, not merely in the lay press of this country, but in Colonial, American and Continental technical journals. Periodical conferences have been provisionally arranged for, and the Chemistry Section is sure to gain from the useful practical advice which will thus be available. The scheme does not mean that official "dope" will be pumped fortnightly or monthly into the various journals; it simply means that all the journals directly concerned in the Chemistry Section will have equal access to information, and will be able to deal with it from their own distinctive points of view. The experiment is interesting as the first definite link between organised chemistry and the public press.

The account which Mr. Woolcock gave of the arrangements already completed and in contemplation was extremely encouraging. The exhibits in the Chemical Hall of the Palace of Industry promise fully to justify Sir Max Muspratt's recent prediction that they will be completely representative of British chemical industry. As a spectacle it is sure to be impressive, but that is not enough. The idea, in Mr. Woolcock's words, is to show that behind the exhibits a stream of British research and invention is flowing so strongly as to supply an absolute guarantee for chemical industry in the future. To this end the Association has secured the co-operation of the best scientific minds in the country in showing, by experiments, lectures, and so forth, the advances made in the last twenty years in all branches of chemical science. Inexpensive pamphlets, written in a popular style, will be published with the purpose of enlightening the general public as to the present state of knowledge; in addition, a large volume, a kind of miniature chemical library, prepared by a group of leading experts, will cover the whole ground from the more strictly scientific point of view. "The biggest thing ever attempted in British chemical industry" is Mr. Woolcock's description; on the whole it does not seem extravagant.

Unconsciously or deliberately, this scheme falls in remarkably well with the larger publication for the whole Empire, further particulars of which we are now able to announce. Simultaneously with the opening of the British Empire Exhibition next spring, under the patronage of the Prince of Wales, there will be brought into existence, through the agency of the Federation of British Industries and with Ernest Benn, Ltd. (Benn Brothers) as the publishers, a great publication containing a comprehensive survey of the resources and possibilities of the Empire for the use of business men in this country and overseas. The Federation of British Industries are themselves organising the preparation of the matter. Their vast knowledge of the requirements of commerce and industry enables them to classify and elucidate, to a fine degree, the special requirements of the Empire trades. Sir Eric Geddes, the chairman of the Federation, is taking a personal interest in the undertaking, and the Prince of Wales contributes a "foreword," in which he recommends the work to the attention of "all those who have at heart the proper organisation of the Empire's natural wealth."

Briefly stated, this Business Man's Guide to Empire Trade will put commercial men and traders throughout the world in possession of a summarised index of Imperial products, with the information which is necessary to enable them to buy, where and when they can,

within the Empire. It will have the further value that it will enable other nations to buy from the Empire by showing them where, within its confines, the raw materials and manufactures they need are available. The various Governments of the Empire are co-operating in supplying much of the information on which the work will be based. The completed work will comprise twelve volumes, covering the resources of the Empire in food and raw materials, also the requirements, present and prospective, in relation to production.

To meet the needs of producers, each volume of the book will give the fullest possible particulars of the demands of the different parts of the Empire for raw materials, of the sources from which these demands are at present met, and of the principal importers of the different commodities. The producer will have thus brought to his notice in an authoritative form the information essential to him if he is to extend his business, and at the same time will be given an indication of the markets on which he can best concentrate with a view to developing the trade of his own country at the expense of foreign competitors. To meet the needs of manufacturers, each volume will show at a glance not only the precise amount of the exportable surplus of the different commodities, but also particulars as to their quality and the industrial use to which they are best adapted, the usual channel of supply, such information as can usefully be given regarding average prices, and the names and addresses of principal producers, merchants or exporters from whom they can be obtained. After analysing and detailing the present production and the present consumption of raw materials in the different countries, the survey goes on to deal with the potential future supplies, and thus to provide merchants, banks, financial houses and development companies of all kinds with invaluable information never previously collected in a single undertaking. Circulating through the entire world, the twelve volumes will form an indispensable adjunct to trade.

Conditions in the Coal Market

At this season of the year it is customary to find that advantage is taken of the activity which is occasioned by the demand for coal from householders who leave their cellar-filling to the last moment instead of profiting by the summer slackness in this trade. The usual slight increases in domestic coal prices have again been announced, but there is no very substantial improvement in actual trading conditions to account for the rise. The recent advances in household grades have, in fact, not been general; and apart from the best grades, which are running to maximum list values, the market is not making any great show of strength. So far as industrial coals are concerned the situation at the different centres throughout the country is of a contradictory nature. In the Durham area, for instance, considerable improvement in the general tone of the market is reported, with a good all-round inquiry and firmer prices for steam and coking coals, while from the Welsh fields one gets the information that the demand from abroad is extremely quiet and shows no immediate prospects of improving, with the result that the outlook is not altogether cheerful and lower prices tend to prevail.

There can be no doubt that the recent developments in the Ruhr have produced a good deal of uncertainty as to demands from abroad in the near future. It seems more than probable that before long some working agreement between the French and Germans will be arrived at, and this may be followed by the cancellation of contracts, a prospect which is causing a certain amount of concern and no little speculation as to the future. It may be given as a general opinion that the prices of coal will not harden to any extent until a permanent expansion in home trade occurs, and such expansion must inevitably depend largely upon the state of affairs in the iron and steel industries. So far as the latter are concerned a more hopeful feeling is now in evidence, but the long-delayed revival still hangs fire; and it is therefore unlikely that the industrial coal consumer will be called upon to meet higher prices for at least some little time to come.

Duisberg's Dictum

If dyestuff research and organisation have lost by the withdrawal of Dr. Levinstein from the industry, chemistry in general promises to gain by the useful public work he is now undertaking. It is encouraging to find, too, that one who might have played the part of a trenchant critic has avoided that unprofitable rôle, and is instead loyally defending the reputation of the British chemical industry and working to safeguard its vitality. In recent issues we have sought to correct some imperfectly balanced views of research in relation to production, salesmanship, and other equally necessary factors, but Dr. Levinstein states the case in a way very few can quarrel with. It is, he says, a mistake to imagine we are catching up Germany by merely copying German patents, or even by making in England things previously made in Germany. If we did nothing more than this our position would be that of followers instead of leaders; yet, when a nation wakes up from a trance and finds itself a quarter of a century or more behind a more alert rival, it is compelled to follow for a time until it draws level, as we are steadily doing. But the point in Dr. Levinstein's mind is excellent. While making up our lost ground we must also break new, and there the research man, probing into unknown fields, is indispensable. He is the forerunner of all real progress. We believe everybody concerned in chemical industry subscribes to that article of faith; the only problem is how to find the money to finance research, and how to relate research to commercial production and sale.

Just now it seems the fashion to quote Dr. Duisberg's dictum that Great Britain could never build up a great dyestuff industry because its leaders were incapable of fixing their eyes on distant results. It is quoted as if the German writer had suddenly acquired some kind of apostolic authority. Applied to pre-war days it might have been justifiable satire; applied to the situation to-day it is euphonious clap-trap. The people who in the early days of the war set out to establish a home dyestuffs industry had enough vision to carry them over what almost seemed at the time insurmountable difficulties, and their vision is not yet restricted nor their resolution weakened. Duisberg's precious theory applies, certainly not to the founders

of the new dyestuffs industry in this country, but very pointedly indeed to those critics who enthusiastically enlarged on every mistake that was made, and as persistently ignored the great structure of a new industry that was rapidly rising under their hands. Dr. Duisberg might truthfully revise his dicta on British characteristics. He might say that the history of the modern dyestuffs industry illustrates the British habit of criticising the little things that go wrong and taking for granted the big results that emerge in spite of the faults.

Progress of Government Research

THE report of the Department of Scientific and Industrial Research for the year 1922-23, an abstract of which appears in this issue, shows that a very large amount of really useful work is being done under the direction of this department. In addition to the work of the National Physical Laboratory, which performs an invaluable function that engineers and manufacturers of precise instruments more and more avail themselves of, the Fuel Research Board and a number of other special boards and committees have been engaged on work of considerable national importance with usually a very obvious bearing on industrial possibilities. The survey of the possibilities of power alcohol production in the Empire by the Fuel Research Board and the work of the Chemistry Co-ordinating Research Board on the possibility of producing formaldehyde from carbon monoxide and hydrogen are two examples of the kind of work which is likely to prove valuable and which could not be nearly so readily undertaken by other than an official body. This by no means exhausts the list of outstanding work of this type, other examples of which have been undertaken by other sections dealing, for example, with engineering, forest products, and mineral resources. When it is considered that the expenditure of the Department as a whole is extremely moderate it is obvious that it does not share the traditional reputation of extravagance and inefficiency sometimes popularly associated with government departments.

Professor Perkin's Appointment

THE appointment of Professor W. H. Perkin as adviser to the headquarters research staff of the British Dyestuffs Corporation, in succession to Professor A. G. Green, will be generally welcomed. As a distinguished chemist himself, he has all the qualifications for such a post, and, as a son of the great British chemist who discovered the first aniline dyestuff, there is a peculiar personal appropriateness in such a succession. Professor Perkin is known rather as a great organic chemist—one of the greatest, in fact, of his time—than as a specialist in dyestuff research. His grasp, therefore, of the fundamentals of research in organic compounds should fit him admirably for the post of general adviser to the research staff. The conditions obviously are such as Professor Perkin is able to accept, and though no one doubts the sincerity and disinterestedness of Professor Green's action, the new appointment shows that there may be more than one opinion, even among authorities on dyestuff research, on the policy which brought it about.

Points from Our News Pages

An abstract is given of the Report of the Department of Scientific and Industrial Research (p. 390).

Dr. Levinstein, speaking before the Manchester Section of the Society of Chemical Industry on Friday, October 5, reviewed our "Recent Progress in Chemistry" (p. 393).

The death is announced of Mr. William Thompson, at Manchester, and of Dr. J. A. Harker, in London (p. 395).

Professor W. H. Perkin has been appointed Director of Research to the British Dyestuffs Corporation in succession to Professor A. G. Green, retired (p. 395).

According to our London Market Report there has been a considerable improvement in trade during the past week (p. 403).

The position in the Scottish chemical market remains practically unchanged, according to our report (p. 406).

Books Received

KELLY'S DIRECTORY OF THE CHEMICAL INDUSTRIES. London: Kelly's Directories, Ltd. Pp. 920. 30s.

TREATISE ON GENERAL AND INDUSTRIAL ORGANIC CHEMISTRY. Part II. By Dr. Ettore Molinari. London: J. and A. Churchill. Pp. 440. 30s.

ALLOYS RESISTANT TO CORROSION. A General Discussion held jointly by the Faraday Society and the Sheffield Section of the Institute of Metals. London: The Faraday Society. Pp. 76. 5s. 6d.

THE TWELVE-HOUR SHIFT IN INDUSTRY. By the Committee on Work-Periods in Continuous Industry of the Federated American Engineering Societies. New York: E. P. Dutton and Co. Pp. 302. $3.50.

The Calendar

Oct. 13	North of England Institute of Mining and Mechanical Engineers: General Meeting, 2 p.m.	Newcastle-upon-Tyne.
13	Mining Institute of Scotland: General Meeting, 3 p.m.	Heriot Watt College, Chambers Street, Edinburgh.
15	Institution of the Rubber Industry (Manchester Section): "Rubber Machinery." Mr. W. C. Young. 7.30 p.m.	Midland Hotel, Manchester.
16	Institute of Metals (Birmingham Section): Dr. F. Johnson. 7 p.m.	Chamber of Commerce, New Street, Birmingham.
16	Hull Chemical and Engineering Society: "Spinning Tops and Gyroscopic Motion." Mr. L. C. Perkin. 7.45 p.m.	Hull Photographic Society's Rooms, Grey Street, Hull.
17	Society of Glass Technology. 3 p.m.	The University, Sheffield.
18	Chemical Society: Papers by R. G. W. Norrish. 8 p.m.	Burlington House, Piccadilly, London, W.1.
18 & 19	Textile Institute; Autumn Conference. Papers by P. E. King, of Leeds University, and Professor J. Thorpe, of the Imperial College of Science.	Leicester.
18-20	Institute of Chemistry: Conference.	Liverpool.
19	Society of Dyers and Colourists (Manchester Section): "Some Aspects of the Theory of Quinones." Professor R. Robinson. 7 p.m.	36, George Street, Manchester.
19	Institute of Metals (Scottish Section): "Large Metallic Crystals and some of their Properties." Professor W. C. H. Carpenter. 7.30 p.m.	39, Elmbank Crescent, Glasgow.

The Department of Scientific and Industrial Research

Report for the Year 1922-1923

The report of the Committee of the Privy Council for Scientific and Industrial Research for the year 1922–23 has recently been published by H.M. Stationery Office (4s.), and contains a valuable record of industrial research carried out by the Fuel Research Board, the National Physical Laboratory, the Chemistry Co-ordinating Research Board, and other Departments.

New Government Site at Teddington

THE report states that towards the close of 1922 it was learnt that the Government proposed to allocate a sum of about £23,000 as part of their plans for the relief of unemployment to the construction of roads on the land adjoining the National Physical Laboratory which had been acquired in 1920. The Department was asked to consider the proposals of the Office of Works, and accordingly a Committee was appointed to consider the matter.

The Committee recommended that future buildings needed by the National Physical Laboratory should be placed on the land lying south and west of the new main road, and that in view of the necessity for quiet and freedom from dust, in physical research, buildings for that laboratory should have a prior claim, subject to any other overriding needs, to the sites bordering on the Park. The Committee proposed that the Chemical Laboratory for the Department should be placed, when funds can be provided, on the site lying north of the main circulation road, and that a suitable site for the proposed new Road Board Laboratory could be found at the corner of Coleshill Road.

The Work of the Fuel Research Board

The Fuel Research Board during the year have erected new experimental vertical retorts, based on Scottish shale oil practice, with a view to low temperature carbonisation on a commercial scale. It is proposed to briquette a blend of coking and non-coking coals by raising them to a temperature below the decomposition point, and then subjecting them to pressure without any added binder. The briquettes will then be carbonised in the new retorts. A considerable amount of preliminary work was necessary before the details of the retort and briquetting press could be decided on, and the plant has not yet been running sufficiently long for any conclusion to be reached. A report on some preliminary experiments in low temperature carbonisation in vertical retorts has been published in Technical Paper No. 7.* The results of some comprehensive tests on the efficiency of water-gas plant working under various conditions have been published in Fuel Research Board Technical Paper No. 6.†

In addition the Board has carried out a variety of smaller scale work, including tests on the combustion of coke, tests of CO_2 recorders, tests on the Thomas recording calorimeter and on the use of tetralin and tetralin-petrol mixtures for motor-car engines. Experiments are also being carried out with a view to developing a producer gas plant for use in the Colonies, where charcoal is available but water is scarce and petrol or similar fuels expensive. An investigation has also been carried out at the request of the Development Commission into the carbonisation of seaweed, with a view to determining the possibility in the present circumstances of reviving the seaweed industry on the Atlantic coast. A report on this is being prepared for publication.

The first section of the report of the Fuel Research Board for the years 1922-1923 has been published, and deals with the work done in connection with the production of air-dried peat.‡ This includes a report by Professor Pierce F. Purcell, M.A.I., M.Inst.C.E., Peat Investigator to the Board, on the present position as to the winning of peat in Ireland, Canada, Sweden and Germany. Professor Purcell has dealt with the problems involved in the working of peat bogs on a large scale and has visualised possible schemes for peat-winning on a scale of 100,000 tons per annum from one bog area over a period of years. He has shown very clearly, and for the first time, the vital importance of the initial lay-out of the bog for a definite scheme of development year by year over a sufficiently long period. Only in this way can trustworthy estimates be made of the amount of peat which can economically be won from a given bog, and the approximate cost of winning it.

Power Alcohol

Further knowledge has been accumulated in regard to the optimum conditions for carrying out the acid hydrolysis of cellulosic materials, and the mechanism is now well established to ensure the maximum production of pentoses with a very low strength of acid at a moderate temperature and pressure. The fermentation of the pentoses, by means of *Bacillus acetoethylicum Anthrop*, has been the subject of a number of laboratory and semi-technical scale experiments with wheat straw and African grasses.

Supplies in quantity of African grasses are now being procured for manufacturing scale experiments to enable the economics of the process to be studied. This fermentation produces a mixture consisting of approximately 85 per cent. of ethyl alcohol and 15 per cent. of acetone.

Work on the direct fermentation of cellulosic materials by means of micro-organisms has included (1) a search for micro-organisms capable of fermenting cellulose direct; (2) the determination of the minimum concentration of glucose required by yeast for alcohol production; (3) the determination of the maximum concentration of glucose accumulated by various types of mould during their growth on and decomposition of cellulose. The results so far obtained are inconclusive.

The production of alcohol on a commercial scale for use as an ingredient of a liquid fuel for internal combustion engines has been commenced in this country. The Distillers' Company, Ltd., has erected mixing plants at three centres, and is supplying "Discol," which is a mixture of 50 per cent. denatured alcohol and 50 per cent. of a blend of hydrocarbon spirits.

Dr. W. R. Ormandy and Mr. E. C. Craven have continued, with financial assistance from the Department, their researches on the physical properties of mixed fuels for internal combustion engines and have published several papers on the subject.

National Physical Laboratory

With a view to making the fullest use, for the purposes of fundamental research, of the resources of the National Physical Laboratory, the Executive Committee during the past year has appointed a Research Committee, consisting of Sir J. J. Thomson, O.M., F.R.S. (chairman), Sir Wm. Bragg, K.B.E., F.R.S., and Sir Ernest Rutherford, F.R.S., with the Chairman of the Executive Committee *ex officio*, to advise and assist it in planning schemes of research to be carried out at the Laboratory. This Committee has already held a number of meetings and will visit the Laboratory from time to time in order to follow the progress of the work and to help in suggesting new developments.

In the Metallurgy Department research on ferrous alloys has been begun for the Alloys Research Committee, and good progress has been made during the year. Considerable progress has been made in the study of the iron-chromium alloys. The effect of oxygen on iron is also being examined. The research for the Admiralty on the effect of mass on the heat treatment of nickel steels has been completed. Researches are proceeding on the physical constitution of metals and alloys, and the preparation of certain metals in a very high state of purity has been commenced. An investigation is proceeding into the generation of heat in metals by deformation. The research on the physical properties of glass has been continued for the Glass Research Association.

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* Fuel Research Board Technical Paper No. 7: Preliminary Experiments in the Low Temperature Carbonisation of Coal in Vertical Retorts. Published by H.M. Stationery Office. Price 9d. net.

† Fuel Research Board. Technical Paper No. 6: Comparisons of Some Methods of Running Water-Gas Plant. Published by H.M. Stationery Office. Price 2s. net.

‡ Report of the Fuel Research Board for the years 1922-1923. First Section: The Production of Air-Dried Peat. Published by H.M. Stationery Office. Price 5s. net.

Chemistry Co-ordinating Research Board

Investigations on behalf of the Chemistry Research Board have been continued at the Royal Naval Cordite Factory on the oxidation of hydrocarbons. The chief object of these investigations, as mentioned in previous reports, is to provide, if possible, a method of manufacturing formaldehyde in this country. The laboratory investigations on the subject have continued and extended the results of previous investigations. Several papers embodying the scientific results of the work, have been published.* The laboratory results are of such a nature as to indicate a possible, though not very promising, commercial method of manufacturing formaldehyde, and the Board decided to continue the investigations on a semi-manufacturing scale in order to obtain definite data on the possible value of the method. This work has been proceeding throughout the year. It is not yet complete, but so far as it has gone at present it does not appear likely that a successful commercial method will be evolved.

A point of vital importance in connection with the industrial application of the results obtained in these investigations is the availability of such gases as methane, ethylene, and ozone. The possibility of utilising coal gas, coke-oven gas, and natural gases, the last especially abroad, is being considered. Valuable information as to the nature of natural gas resources in Canada has been supplied by the Department of Mines, Ottawa, and a report has been received on the supply of natural gas in the United Kingdom.

At the Research Department, Woolwich Arsenal, attempts were made to produce formaldehyde by the interaction between hydrogen and carbon monoxide, and hydrogen and carbon dioxide, respectively, in the presence of various catalysts. Only traces of formaldehyde were obtained in each case. Experiments were also made on the partial oxidation of methane in presence of silica-gel as catalyst, and these gave some measure of success, although the results were less promising than those obtained at Holton Heath without a catalyst. It was thought that the addition of carbon dioxide to the methane oxygen mixture might increase the yield of formaldehyde on the methane consumed, and this appeared to be supported by experimental evidence. The reaction between methane and carbon dioxide was also investigated.

Experiments on luminous radium compounds have been continued at the National Physical Laboratory. The variation of the rate of decay of luminosity with radium content has been further investigated. The possibility of substituting mesothorium for radium has been examined. The substitution has some disadvantages, owing to the shorter life of mesothorium; but it may be of practical advantage under certain conditions.

Explosiveness of Ammonium Compounds

Investigations have been carried out with the object of ascertaining the causes of the explosion of ammonium sulphate-nitrate at Oppau in Germany. The Government Chemist made a thorough examination for the Board of samples of the salt obtained from Germany. No impurities such as could be held responsible for the explosion were detected. The salt appeared to be in the form of mixed crystals, and not a double salt. The cause of the hardening of the salt is attributed to the presence of a small quantity of moisture; in this condition it cakes under pressure. Experiments have been carried out at the Research Department, Woolwich, on the possibility of detonating the salt. The results are mainly negative in character; it has been found impossible to cause detonation, even under very favourable conditions. The exact cause of the explosion remains, therefore, somewhat obscure.

The Committee appointed to consider the possibility of improving the present tests for "permitted" explosives in coal mining recommended research work of a fundamental character under the supervision of a committee placed definitely under the control of the Department of Mines. Following on the Committee's report, the attention of the Board was drawn to the fact that no satisfactory method existed for determining the sensitiveness of an explosive, and as a result, the Board is now contributing towards the cost of a general investigation, in so far as it affects civilian interests, upon the sensitiveness of high explosives. The investigation is to be conducted at the Royal Arsenal, Woolwich.

Corrosion of Aluminium

Work on the corrosion of aluminium and its alloys has been continued under the direction of a Committee of the Institute of Metals. In spite of the difficult nature of the subject, substantial progress has been made. Attention has been mainly directed to the protection of the metal by the formation of a skin of oxide. It has been established that while this method delays corrosion under ordinary conditions, it fails under very severe conditions such as are experienced when metal is alternately wetted by sea water and then dried. The film of oxide has strong adsorbent properties, and, by the adsorption of suitable materials which are very difficult to remove, the protective properties of the film are greatly enhanced. Trials made of samples of aluminium and certain of its alloys, protected by these means, have hitherto proved extremely satisfactory. An account of the work will be published.

Oxygen Research Committee

During the year the report of the Oxygen Research Committee has been prepared and will shortly be published. This report consists principally of a description of the Committee's own investigations and results, particularly in the improvement of the known methods of handling liquid oxygen and liquid air on a practical commercial scale. Of these methods the Committee has been principally concerned with the development of the double-walled vacuum vessel as a container for the liquid. The experimental work undertaken at the Air Ministry for the Committee has been continued. The examination of heat losses, particularly in so far as these influence the design of the necks of vacuum vessels, is being undertaken by more accurate methods. The mechanical defects of large containers are receiving fuller attention. Some additional investigations have also been undertaken at Oxford, under the supervision of Mr. B. Lambert, to ascertain more accurately the evacuating power of various adsorbents under conditions similar to those obtaining in vacuum vessels containing liquid air.

Gas Cylinders Research

At the close of the year 1921–22, after the publication of its first report,* the Gas Cylinders Committee turned its attention to the problems relating to cylinders for the transport of gases in the liquid state, and to the consideration of the possibilty of the use of alloy steel or other alloys for the manufacture of light cylinders.

Liquefiable Gases.—A review was made in the first place of the known information on the physical properties of the so-called "non-permanent" gases which came under the purview of the Committee. It was found that not only were there many discrepancies, but that, in some cases, information of vital importance to the work of the Committee was not available. It was decided, therefore, to undertake the experimental verification of the uncertain data, and the determination of the unknown data, at the National Physical Laboratory. The necessary experimental plant has been designed and constructed, and these investigations are now in progress.

Cylinders of Alloy Steel.—After reviewing the possibilities of manufacturing cylinders of various alloy steels, it was decided to secure, if possible, the co-operation of steel and gas-cylinder manufacturers. A questionnaire on the subject of alloy steels suitable for the manufacture of gas cylinders was therefore sent to a number of firms, and, as a result of the replies received, an order has been placed with three firms for the supply of a number of experimental cylinders.

Cylinders of Duralumin.—In order to explore further the possibility of the production of light cylinders for special purposes, a specification was drawn up for the manufacture of cylinders of duralumin. Some experimental cylinders have been manufactured and supplied, and an exhaustive series of tests is now in progress at the National Physical Laboratory.

Further Researches.—An investigation has been begun at the National Physical Laboratory on the effect of repeated heat treatment of wrought iron and steel. This investigation is of importance in view of the practice of heat-treating periodcally certain types of gas cylinders.

* The Oxidation of Hydrocarbons with Special Reference to the Production of Formaldehyde. By E. W. Blair and T. S. Wheeler. *Trans. Soc. Chem. Ind.*, 1922, 41, 303; 1922, 41, 331; 1923, 42, 81; 1923, 42, 260.

* First Report of the Gas Cylinders Research Committee. Published by H.M. Stationery Office. Price 7s. 6d. net.

Recent Progress in Chemistry

Dr. Levinstein's Opening Address to the Manchester Section

THE first meeting of the Manchester Section of the Society of Chemical Industry for the Session 1923–1924 was held on Friday, October 5, Dr. H. Levinstein being in the chair. In opening the proceedings the chairman referred to the death of Mr. William Thomson, an original member of the Society, and a member of the Committee of the Manchester Section from as far back as 1885, and the Honorary Secretary (Mr. L. Guy Radcliffe) was authorised to send a vote of condolence to the family. The President of the Society (Dr. E. F. Armstrong) was present.

The Hon. Secretary announced that in addition to the items already published in the programme, Dr. Knecht would read a paper on February 1, 1924, on "The Dehydration of Alcohol," and there was also reason to believe that the section would have a paper from Dr. A. Renshaw upon "Antiseptic Properties of Dyestuffs," though it was not yet possible to state the exact title of the communication.

"Recent Progress in Chemistry"

In the course of his presidential address, Dr. Levinstein said that when he last had the honour of addressing the Section in March he reviewed briefly the progress made in British Chemical Industry since 1914. The war gave the opportunity for English chemical manufacturers to supply products for which a demand had previously been created by the German I.G., and which had become necessary for the conduct of our trade as a nation. Thus very large dyestuff and other factories were erected, and of their activities he endeavoured to give some brief account.

They would not fall into the error of thinking that "Capturing the German trade"—he believed that was the correct catch phrase—was quite so simple a matter as merely making in England things previously made in Germany. It was not always easy to copy a German dyestuff merely from a specification. It was certainly necessary to do this so that you could supply the products which the consumers had been accustomed to get from Germany, but this was just ordinary business routine in a dyestuff factory. It was sometimes not easy to do this, but in the technology of the dyestuff and fine chemical industry one did not expect it to be. Consider for one moment the life history of such a substance. Discovered in a German dyestuff laboratory, it was picked out by a discerning German technologist as a likely commercial "winner," made on a large scale probably in existing plant until a demand had been created for it by a German technical sales organisation satisfied of its merit and determined to make it a commercial success. We should have a false sense of values if we considered that we were catching up merely by copying German patents, and he regretted the publicity which was sometimes given to this phase of the question. Surely none of their number would think it possible to battle successfully in the world's markets by copying other people's products after they had been proved commercially successful by enterprising competitors. Everybody knew that the dye industry was not static, but moved on. Frequently the statement was made that we in this country were 40 years behind the Germans in chemistry. This view was erroneous. In some branches of chemical science we led the world, while in none could we be said to lag conspicuously behind any other nation.

Chemistry at the Empire Exhibition

The British chemical industry would be very well represented at the British Empire Exhibition at Wembley, to be opened in April of next year. The industrial exhibit was to be managed by the A.B.C.M., under the admirable direction of Mr. Woolcock. It would be a collective exhibit in the sense that every exhibit would form part of a homogeneous scheme. There would also be an exhibition of British chemical science, which would be placed close to the industrial section, and would add greatly to its value. This scientific exhibit was being organised by a thoroughly representative committee, for it contained representatives appointed by the Royal Society, The Chemical Society, the Institute of Chemistry, the Society of Dyers and Colourists, the Institute of Petroleum Technologists, the Society of Chemical Industry, and the A.B.C.M., and also of the Federal Council of Pure and Applied Chemistry. Further, it had the great advantage of being in consultation with and represented on the British Empire Exhibition Committee of the Royal Society.

It was, he thought, of significance that the A.B.C.M. should consider a pure science exhibit to be necessary for the proper appreciation by the world of the prospects of British Chemical Industry, and that they were prepared to contribute very substantial funds for this purpose, as were also the Society of Chemical Industry and the Chemical Society. It was equally delightful to find that the scheme was strongly supported by the Royal Society with its great tradition and authority. It would be a mistake to entertain such a plan if they were not assured of a completely representative exhibit embracing every branch of chemical science, showing a complete and wonderful picture. For this assurance they were greatly indebted to the Royal Society, whose co-operation and goodwill had alone made it possible to secure the object they had in view. It had the support of every university laboratory in the kingdom, and he hoped that they would be able to secure the support of every university laboratory within the Overseas Dominions, many of which had valuable and original work to show.

Science and Industry

It was quite obvious why the A.B.C.M. should play a great part in organising this purely scientific problem. Their interests were commercial. Their desire was to secure more trade for the British chemical industry, in particular more trade between Great Britain and the Overseas Dominions. The exhibition was, however, not to be a fair. Nothing was to be sold over the counter. The effect aimed at was deeper. It was desired to demonstrate the strength, efficiency, enterprise, and range of all branches of British chemical industry. It would enhance this country's prestige in all parts of the world, creating a new atmosphere in the minds of Overseas buyers more favourable to British chemical industry. He referred particularly to the organic, highly specialised industries in which, prior to the war, we were not conspicuously strong.

Our heavy chemical industry had not, perhaps, a great deal to do to maintain its prestige. It was different with the dyestuffs and fine chemical industry, which depended so largely for success on invention. Industries dependent upon research could not be made to flourish by any Government Act. They could only live permanently in a country where chemical teaching and chemical industry were adequate both in quality and quantity.

Research on the Atom

Dr. Levinstein proceeded to review the research work in connection with the structure of the atom from the time of Dalton to the present day. A new chemistry was arising of which the spectroscope was the key, and the composition of all matter resolved itself into a simplicity contemplated by some of the earlier Greek philosophers. The experimental proof of these undoubted facts was chiefly due to British science, and was accompanied by extraordinary experimental difficulties, but could be shown in the most charming manner. The fact was that we were living in a classical period in the history of natural science. The work of J. J. Thomson and of Rutherford marked an era, as did that of Lavoisier and that of Dalton. No one doubted the material nature of electricity to-day. It would be easy to grasp the full significance of the work done in this direction by British scientists when one saw the photographs by C. T. R. Wilson, or saw with the eye, as he hoped every visitor to Wembley would be able to do, individual electrons or alpha particles impinging on a screen.

Dr. Levinstein referred to the discovery of Helium, in 1868, by Frankland, Lockyer, and Janssen during an eclipse of the sun. Ramsay found Argon in 1894, and isolated Helium in Cleveite in 1895, the same year in which Röntgen discovered the Röntgen rays and gave the spectroscope its most formidable weapon. Becquerel discovered the radio-activity of

Uranium in 1896. These three discoveries, in which three nations played a part, rendered these years wonderful in the history of science. Not long after, Krypton, Neon, and Xenon were found in our atmosphere by Ramsay. Argon was used to-day to fill the ordinary half-watt lamps and Helium was of the greatest potential importance for filling airships. Then there was the exciting discovery, in 1903, by Ramsay and Soddy, that Radium-emanation produced, spontaneously and continuously, Helium.

One of the greatest losses science had sustained in the war was the death of H. J. S. Moseley in Gallipoli. Examining the "X-ray" spectra of various elements, Moseley found that the wave lengths of a corresponding line in different elements were in exact numerical relationship. The work of Aston and Sir Wm. Bragg was also referred to. A new light had been thrown upon our conception of Valency and chemical combination by the electronic theory, which we owed principally to the study of radio-active matter and to the study of "X-ray" spectra.

Dr. Levinstein also referred to the investigations of Lapworth and Robinson in 1919, respecting the alternation of positive and negative polarities in a chain of atoms, the precise order being set by a particular atom or group, and said that this was not peculiar to benzene derivatives, but was perceptible, especially where unsaturated chains were concerned, throughout organic chemistry. This generalisation was now known as the Principle of Induced Alternate Polarities, and was destined to have a considerable influence on the future development of organic chemical theory. Werner's co-ordination theory was also referred to.

Physicists had led them especially to two conceptions of the atom, the Bohr-Rutherford theory and the Langmuir-Lewis theory, neither of which was yet capable of explaining all the problem of Valency.

To-day there were several organic chemical schools in this country equal to any organic chemical schools in Germany, by whatever standard one chose to measure them. W. H. Perkin, at Oxford, was the doyen of organic chemistry to-day. Systematic organic chemical research in this country commenced with Perkin, and to no man in England did organic chemistry owe so much. Dr. Levinstein then referred to the work done by Dr. Henry, head of the Burroughs Wellcome Research Laboratory, and Professor Pyman, F.R.S., with respect to alkaloids, Principal Irvine with respect to sugars, and Professor G. G. Henderson, F.R.S., with respect to terpenes, Professor Heilbron with respect to plant colouring matters, Professor Hewitt, F.R.S., with respect to coal tar colouring matters, Professor J. F. Thorpe, F.R.S., with respect to general organic chemistry, and Sir J. Russell, K.B.E., F.R.S. (Director of Rothamstead), with respect to agricultural chemistry, and a large number of other investigators with respect to biochemistry, general and physiological chemistry, proteins, enzymes, fermentation, etc. He dealt at considerable length with investigations in connection with inorganic chemistry and chemical engineering.

On the motion of Dr. E. F. Armstrong, seconded by Dr. E. Ardern, a cordial vote of thanks was passed to Dr. Levinstein for his address.

Dr. E. F. Armstrong, president of the society, in proposing the vote of thanks, said the chemical industry was, above all other industries, the most technical. Discoveries had to be made in research laboratories, and had to be made by chemists. Much more control must be in the hands of the technical man than was the case with other industries. It might be possible in other industries for a man having no knowledge of the industry to use his business acumen to control it, but in chemistry technical control was absolutely vital.

A Device for Volumetric Analysis

THE Fixanal preparations which have recently been introduced for making normal solutions for use in volumetric analysis are ingeniously devised glass tubes containing a tenth equivalent of a particular reagent, so arranged that the tube is easily broken in the funnel of the standard flask and the contents washed in without loss. The accuracy of the contents of the tubes is guaranteed by tests carried out from time to time in the analytical laboratory in the University of Leipsic. Descriptive literature may be obtained from J. Sherman and Co., Ltd., Downham Mills, London, N.17, who also supply the tubes.

British Empire Exhibition of 1924

Publicity for the Chemistry Section

THE editors of various technical journals met Mr. Woolcock, the General Manager of the Association of British Chemical Manufacturers, at the offices of the Association in Piccadilly on Monday to discuss with him the progress which has been made with the preparation of the Chemical Section of the British Empire Exhibition.

In the course of the conversation Mr. Woolcock said that the Chemical Section, which was being organised by the Association and occupied nearly 40,000 square feet in the Palace of Industry, could be built in such a way as to form a hall within the palace. About £100,000 would be spent in presenting to the public a picture of the present state of British chemical industry. No important firm in the industry would be unrepresented, and the whole of the individual exhibits, numbering about a hundred, would, by reason of their position and character, combine to form a magnificent illustration of the industry. The treatment of the individual stands was being done on lines which had never before been attempted, and the old and somewhat hideous structures which had disfigured exhibitions in the past would not appear. Considerable attention has been paid to the layout and to the decoration of the Chemical Hall. There would, for example, be about 200 yards of a specially painted frieze illustrating various operations in chemical manufacture, and, as the majority of the stands were being designed by the same architect, the treatment of each stand was likely, while maintaining the individuality of the occupier, to present a very pleasing picture of the hall as a whole. It had not, however, been considered sufficient merely to show visitors examples of the products of the industry. The best possible exhibition of this kind would leave one question unanswered. The visitor might be satisfied that he was witnessing a demonstration of the position to which the industry had attained, but what the critical person who examined the exhibit required to know was whether there was behind this example of what had been achieved a scientific basis which would ensure the continuance of this progress. For this reason in the centre of the Chemical Hall there was to be illustrated the progress which had been made in pure chemistry during the past twenty or thirty years, with a view to showing that the stream of scientific invention in this country was still flowing steadily onwards.

Mr. Woolcock afterwards outlined the scheme of classification which had been adopted for the Scientific Section, and enumerated a number of names of scientists who had already promised their assistance, and very few of the outstanding scientific men of the day were absent from the list. The Scientific Section, Mr. Woolcock added, was being organised by a committee consisting of representatives of the following bodies: The Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, the Society of Dyers and Colourists, the Pharmaceutical Society, the Institution of Petroleum Technologists, the Institution of Chemical Engineers. The Committee was working in close co-operation with the Royal Society. Sir Herbert Jackson acted as the representative of the Royal Society on the Committee and himself in a similar capacity on the Royal Society Committee. In this way they would prevent any overlapping. In order that both the general public and scientific persons may have a record of the exhibit, it was proposed to publish a number of pamphlets specially written for the purpose dealing in popular language with the various classes of exhibits in the Scientific Section. In addition to this it was proposed to publish in more technical language a work which would not only explain the scientific exhibits, but would put on record in a very complete form the state of our knowledge in chemical matters at the date of the Exhibition.

Mr. Woolcock invited the assistance of the editors in making widely known what was being prepared for the Exhibition next year, and the following resolution was unanimously passed:—"That our best thanks be extended to Mr. Woolcock for his courtesy in inviting the editors of the trade and technical Press to meet him, and that we undertake to give him any assistance in our power in organising the publicity service of the Chemistry Section."

The Origin of Petroleum

Paper by Mr. E. H. Cunningham-Craig

In a paper on the "Recent Researches Bearing upon the Origin of Petroleum" before the Institution of Petroleum Technologists in London at the Royal Society of Arts on Tuesday, Mr. E. H. Cunningham-Craig said that of the various theories suggested to explain the origin of petroleum those supposing an organic source were the only ones seriously considered at the present time. The theory of animal origin was chiefly supported by chemists, while the vegetable origin theory was largely held by geologists, and had gained much ground in recent years among practical field-workers.

Referring to the latter theory Mr. Cunningham-Craig said there was a growing tendency at the present time to conduct researches upon the subject of the relations of coals and lignites to petroleum. Every country that contained either coal or petroleum, or both, could furnish some evidence, and it was becoming obvious to geologists that the two fuels had definite relations to each other.

The three main oil-bearing horizons in Trinidad had each a carbonaceous phase in some other district, and the two phases, petroliferous and carbonaceous, approached each other very closely in some localities. Similar evidence was forthcoming from many countries—*e.g.*, Venezuela, Burma, Assam, Hungary and Roumania. In Assam a coal-bearing series succeeded an oil-bearing series, but the two overlapped to some extent, so that oil and coal alternated throughout a zone of appreciable thickness, oil increasing in the lower strata and coal in the upper. In Hungary, owing to careful stratigraphical work, it had been proved that oil-bearing horizons in one district were equivalent to lignitic strata in another, in a different environment. Further evidence of the same kind was forthcoming in Scotland, where petroleum had been found beneath oil-shales, though in small quantities.

Evidence for the Vegetable Theory

The next point mentioned was the research work that had been done upon the hydrogenation of coal. By treating any coal containing a fair percentage of volatile matter with hydrogen under very high pressure, and at temperatures up to 850° F., a remarkable exothermic action is induced and a portion of the solid fuel becomes liquefied, giving as a result a product indistinguishable from heavy crude petroleum. Pressures as high as 3,000 and even 5,000 lbs. per square inch have been used, but action may commence with a pressure of no more than 600 lbs. Temperatures need not apparently be very high, but as the action is exothermic there is difficulty in keeping it from rising too high. The reaction was carried out in an autoclave. The value and importance of these researches of Dr. Bergius lay in the attempt to reproduce conditions similar to those that must have occurred in Nature during the formation of oil. The carbon-hydrogen ratio in coal was too high; therefore, in treating a coal to make oil, hydrogen must be supplied. This Dr. Bergius had done successfully, and the result was stated to be almost identical with crude petroleum, and which in the same way could be separated by fractionation into an enormous range of different chemical compounds.

Artificial Production of Petroleum

But before the vegetable matter had reached the coal stage it was still sufficiently rich in hydrogen, or, to put it more clearly, the carbon-hydrogen ratio had not risen too far. Therefore, in an autoclave under sufficient pressure and at not too high a temperature we should expect petroleum to be formed from vegetable matter that had not reached the coal stage. In a rough calculation made some years ago, the lecturer had estimated that a minimum pressure of as much as 135 atmospheres might be necessary, and that in any case 189 atmospheres would be sufficient. Dr. Bergius had shown that 200 atmospheres was sufficient, though action might begin at as low as 40 atmospheres. He thought it would be interesting if some supporter of the animal theory would conduct the same hydrogenation experiments with deposits containing, or supposed to contain, animal matter, to learn whether liquids indistinguishable from petroleum can be formed from them. The difficulty might be in finding deposits rich enough in animal matter, but there must have been such deposits if there was any truth in the animal origin theory. A shell-bed, a fish-bed, a coral limestone, or a foraminiferal marl, each of which had been claimed at one time or another as a probable parent rock of petroleum, might be experimented with, but it was doubtful if such deposits would give such definite results as accumulations of vegetable matter.

The fact that the reaction was exothermic must not be lost sight of. External heating of the autoclave would retard the action, and the heat engendered by the action might be sufficient to check it and bring about an equilibrium. But in Nature, working slowly through countless periods of time, the rapid heating up of the material by an exothermic reaction would be obviated by conduction. Should the temperature rise sufficiently to check the action, an increase of pressure would start it again till another equilibrium was attained. And so the process might be practically continuous over a lengthy period, with this difference, that a different range of products would be formed under each different condition of temperature and pressure. Thus different classes of crude petroleum might be formed from the same raw material according to the varying conditions of temperature and pressure. The stage of alteration of the vegetable matter must, however, have some effect upon the final result.

The lecturer then went on to consider various vegetable deposits in different states of conversion to coal, and quoted evidence for his contention from the case of the Torbanites, which he described as merely cannel containing sufficient colloidal inorganic matter, which has been subjected to the necessary pressure under adequate sealing—*i.e.*, in a natural autoclave.

Aniline Dye and Chemical Co.

Terms of Settlement Agreed To

In the Lancashire Chancery Court at Manchester on Monday Vice-Chancellor Lawrence, K.C., had before him two summonses in the matter of the winding-up of the Aniline Dye and Chemical Company, Ltd., Trafford Park, Manchester. The summonses were heard together. It appeared that the liquidator, Mr. J. Todd, of Great Winchester Street, London, had entered the names of the executors of the late Earl of Shrewsbury and Talbot in respect of 89,500 £1 shares, and of Sir Henry Busby Bird in respect of 10,500 £1 shares as contributories. On the ground that the shares were fully paid up the Vice-Chancellor was asked to strike the names of the executors off the list of contributories.

Mr. Tomlin, K.C., said the nature of the case was very simple. It was whether there were any circumstances which left it open to the Aniline Dye Company to suggest that the shares held by the late Earl of Shrewsbury and Sir H. B. Bird were not fully paid up, and if it were shown that they were that the names of the executors of these holders should be removed from the list of contributories by the liquidator. The 100,000 shares were purchased by Lord Shrewsbury and Sir Henry B. Bird as fully paid up, and were so allotted. In August, 1920, a Mr. Tinling, who had a controlling interest in what was known as the New Era Syndicate, approached the Earl of Shrewsbury and Sir Henry Bird, and proposed that they should lend £50,000 to complete the purchase of the Larne Salt and Alkali Company in Ireland. This property, it was proposed, would be transferred to the Aniline Dye and Chemical Company, which would pay for it by the issue of 136,000 fully paid up £1 shares. The nominal capital of this concern was £250,000, of which £114,000 had already been issued. The proposal was discussed in London, and the Earl of Shrewsbury expressed a desire to get the views of a stockbroker upon the matter. Another meeting was held, at which a stockbroker was present, and the result of the discussion was that Lord Shrewsbury said he would prefer to buy the shares rather than to lend money on the security of them. It was ultimately agreed that the Earl of Shrewsbury should find £45,000 and Sir H. B. Bird £5,000, and that they should buy 100,000 shares outright. It was also made a term of the arrangement that the Earl and Sir H. B. Bird should be made directors of the company.

At this point counsel consulted, and it was stated that terms of arrangement had been come to.

Mr. Cunliffe said the liquidator considered that there was a case for investigation. The company's books had been examined, and he was satisfied that the names should be struck off the list of contributories.

The Vice-Chancellor: Then I will make an order to that effect.

No order was made as to costs.

Death of Dr. J. A. Harker

Organiser of the Nitrogen Products Committee

DR. JOHN ALLEN HARKER, F.R.S., O.B.E., died on Tuesday at Highgate, London, after a short illness, aged 53. He did valuable work during the war on a number of scientific problems, especially those connected with nitrogen and oxygen.

The son of the Rev. John Harker, Congregational minister, he was born at Alston, Cumberland, on January 23, 1870, and was sent to Stockport Grammar School, studying later at the Universities of Manchester (M.Sc.) and Tübingen (D.Sc.). He was Dalton Scholar in Chemistry at Owens College in 1891, and in the following year was elected Berkeley Fellow in Physics. Joining the staff of the National Physical Laboratory at Teddington, he became chief assistant and head of the Thermometry Division. He was a member of the councils of the Physical Society of London and of the Faraday Society, and a member of the committee of the British Association on gas engines. At the International Petroleum Congress at Vienna in 1912 he was the delegate of the British Government, and in the following year he undertook, temporarily, the office of superintendent of the Eskdalemuir Observatory.

During the war he was responsible for the organisation of the work of the Nitrogen Products Committee of the Ministry of Munitions and was Director of the Research Laboratories set up to study modern nitrogen fixation processes. At the request of the United States Government, he visited America and Canada on the business of the Ministry, and was on board the Cunard liner *Andania* when she was torpedoed off the north coast of Ireland in January, 1918. He also went on similar missions to France, Norway and Sweden. Among the many Government Committees on scientific problems of which he was a member were the Oxygen Committee and the Gas Cylinders Committee of the Department of Scientific and Industrial Research. Dr. Harker contributed a number of papers, chiefly on thermal and electrical subjects, to the *Philosophical Transactions* and *Proceedings* of the Royal Society, and other publications. He married Ada, daughter of the late Thomas Richardson, J.P., of Alston, and had two sons and three daughters. The cremation will be at Golders Green to-day (Saturday,) at 11 o'clock.

The Late Mr. William Thomson

MR. WILLIAM THOMSON, F.R.S. (Edin.), F.I.C., a well-known consulting chemist and analyst, died suddenly in his laboratory in Manchester on Thursday, October 4. He had been a prominent figure among the chemists of Manchester and London during the last 50 years. Born in 1851 in Glasgow, he went to Manchester in 1869 and entered, as assistant to Dr. Crace-Calvert, the Royal Institution Laboratory in Princess Street, the oldest chemical laboratory in Great Britain. Four years later, on August 25, 1873, at the age of 22 years, he became a partner in the firm of Crace-Calvert and Thomson, and, on the death of Dr. Crace-Calvert two months later, took sole charge of the practice and combined with this the office of Public Analyst for Stockport, which he continued to hold until his death.

Mr. Thomson joined the Literary and Philosophical Society in 1873, and served on the Council for many years, acting as president from 1917–19. This Society is richer for his numerous contributions of scientific interest, some of which during his lifetime developed into discoveries of great importance. In November of last year he presented to the Society the actual tubes containing sulphides of calcium, barium, &c., which he demonstrated to Sir William Crookes in 1877, and which proved to be the first of three steps which led to the discovery of "X-rays" by Professor Rontgen. Mr. Thomson's various chemical investigations cover a very wide field. The public will remember his work on the detection of arsenic in beer during the outbreak of arsenical poisoning some years ago, and his indefatigable researches into the amount of soot in the smoke-laden atmosphere of Manchester. In recognition of his contributions to science he was elected a Fellow of the Royal Society of Edinburgh, and he was one of the original members of the Society of Chemical Industry. He was also one of the leading members of the Institute of Chemistry, of which he was elected a Fellow in 1877.

Professor Perkin and Dyestuffs Research

Successor to Professor Green

PROFESSOR W. H. PERKIN, F.R.S., has been appointed adviser to the headquarters research staff of the British Dyestuffs Corporation, Limited, in succession to Professor Arthur G. Green, who recently resigned. Professor Perkin is the eldest son of Sir William Perkin, whose discovery that dyestuffs could be made from coal-tar was the foundation in 1856 of the world industry of synthetic dyes. He was born in 1860, and was educated first in London and then in Germany, where he received his chemical training at the Universities of Würtzburg and Münich. In 1887 he was appointed professor of chemistry at the Heriot-Watt College, Edinburgh, where he remained five years, afterwards passing on to the Victoria University, Manchester, where in 1912 he was appointed to his present position of Waynfleet professor of chemistry in the University of Oxford. He is a fellow of Magdalen College, Oxford. He has published numerous papers in the *Journal* of the Chemical Society, mainly dealing with closed chain compounds, alkaloids, natural colouring matters, camphor and the terpenes, and he is recognised as one of the greatest living authorities on organic chemistry. He was joint author with Dr. F. S. Kipping, the professor of chemistry at Nottingham, of several well-known text-books on organic and inorganic chemistry. Professor Perkin has been associated already to a certain extent with the British Dyestuffs Corporation in controlling their Research Colony at Oxford.

Institute of Chemistry Conference

AN important conference is being organised by the Institute of Chemistry for October 18-20 in Liverpool. On Thursday, the opening day, there will be at 4 p.m. a reception by the Chairman and Committee of the Section, at the Exchange Station Hotel, and at 7.30 an informal dinner at the same hotel. On Friday morning, at the opening session of the conference at the Chemical Lecture Theatre, The University, an address will be delivered by the President (Mr. A. Chaston Chapman, F.R.S.), and a discussion on "The Formation of a National Federation of Men of Science and a General Science Council" will be opened by Professor Baly. At the afternoon session of the Conference the following matters are down for discussion:—(*a*) "The Benevolent Fund": resolution by Mr. R. A. Morton "That this Conference regards with misgiving the present position of the Benevolent Fund; it is of the opinion that the Council should consider the advisability of making an annual levy to be administered on an actuarial basis." (*b*) "The Election of Members of Council": resolution by Dr. R. Thomas "That the present method of electing members of Council be reconsidered with a view to ensuring adequate representation of each Section, and that a small committee be appointed to deal with the matter." (*c*) "The desirability of extending to students in training the facilities for insight into works practice and technical operations": resolution by Dr. Brislee.

To celebrate the forty-sixth anniversary of the foundation of the Institute, a dinner is to be held at the King Edward VII Rooms, Hotel Victoria, Northumberland Avenue, on Monday, December 10, at 7.30 p.m. Tickets for the dinner (15s. each not including wine) for members and their guests (ladies and gentlemen) can be obtained from the Registrar, 30, Russell Square, London, W.C.1, and will be allotted in the order in which applications are received.

Oil Extraction Problems

MANY oil bearing residues and waste products contain a high percentage of valuable oil, which it is very difficult to recover. The solvent system usually offers the best solution to the problem, but even this has not proved successful in many cases, more especially in the case of Fuller's Earth used for filtering or bleaching purposes. The Standar Chemical Engineering Company state that they have recently treated Fuller's Earth with exceptional results, obtaining between 35 and 40 per cent. of oil. They have a full-sized demonstration plant erected in London, and extractions have been made on a large scale, giving results such as would be obtained in actual practice. The company are prepared to offer advice on problems relating to oil extraction.

Society of Public Analysts

AT an ordinary meeting of the Society held at the Chemical Society's Rooms, Burlington House, on Wednesday, October 3, Mr. P. A. Ellis Richards (President) in the chair, certificates were read for the first time in favour of Messrs. Laurence Eversley Campbell, M.Sc. (Lond.), F.I.C.; John Troubridge Hannen, B.A. (Cantab.), A.R.C.Sc., A.I.C.; Cyril Langley Hinton, F.I.C.; Douglas William Kent-Jones, B.Sc. (Lond.), F.I.C.; Thomas William Alan Shaw, M.Sc. (Liv.); William Hall Simmons, A.I.C.; Kenneth Edward Nethercoate Williams, and Percy Noel Williams, M.Sc. (Liv.), A.I.C. Mr. Robert C. Grimwood, D.I.C., A.I.C., was elected a member of the Society.

Abstracts of Papers

In a paper on "The Sampling of Coal: the General Problem and Some Experiments," by Messrs. J. H. Coste, F.I.C., E. R. Andrews, F.I.C., and W. E. F. Powney, F.I.C., attention was drawn to the difficulties encountered in sampling coal, which is often a heterogeneous mixture, and in consequence of which the variations in composition of different "patches" are extremely wide. These variations are likely to be more extreme in those cases where the bulk is large, and where it is impossible to sample throughout the dump. General considerations that should govern the sampling were suggested, and stress was laid upon the point that if, as often happens, different workers obtain different results from samples taken from the same bulk the discrepancies are not due to mistakes in working, but are indicative of the variability in composition of the coal. Experiments were described in which: (1) It was shown how difficult it was to obtain a homogeneous set of samples from so small a quantity of coal as 70–80 lb., and (2) the variation in composition of samples taken progressively from a bulk of about 400 lb.

A new test for distinguishing castor oil from other oils, and determining its purity, was described by Mr. H. B. Stocks, F.I.C. The test is based on the following facts: Ordinary soap solutions are alkaline to phenol-phthalein. On titration with standard acid solution a point is reached at which a state of equilibrium exists and the pink colour disappears. The amount of acid required increases with the dilution up to about 1 part in 150 or higher, at which point it becomes practically constant. With soaps of oleic, palmitic, and stearic acids, and soaps from oils composed of these acids, the figures are equivalent to approximately half the total combined alkali. With castor oil soap it is only 3 to 11 per cent. of the total. Five grams of the oil to be examined are saponified with alcoholic potassium hydroxide, neutralised, evaporated to remove alcohol, made up to 100 c.c.'s, 10 c.c.'s being diluted with 250 c.c.'s of neutral distilled water and titrated with hydrochloric acid in presence of phenol-phthalein. Castor oil gave figures varying between 4·8 and 7·9, and figures were given in the paper for a number of fats and oils and rosin, in each case very much higher than for castor oil.

Mr. A. T. Etheridge, B.Sc., F.I.C., in a paper on "The Volumetric Estimation of Vanadium in Steel," explained that the estimation is carried out in the same solution in which the chromium has already been estimated by treating the aqueous solution of the sulphates of the metals with permanganate, filtering, removing any colour due to iron, treating with standard ferrous sulphate solution, and titrating with permanganate. This gives the chromium figure. The solution is then adjusted so that it contains about 10 per cent. by volume of sulphuric acid, excess of ferrous sulphate is added, and the solution titrated with potassium bichromate, using as indicator 5 c.c. of diphenyl carbazide prepared by dissolving 0·5 grms. in 1–2 c.c. glacial acetic acid, and diluting to 500 c.c., and adding to each 5 c.c. 3 drops of 25 per cent. sulphuric acid and 1 drop of potassium bichromate solution, resulting in the formation of a deep purple colouration. About half the indicator should be added within 1 or 2 c.c. of the end of the titration, and the titration continued till the purple colour has practically disappeared. The remainder of the indicator solution is then added, and the end point occurs within 1 or 2 drops, with the formation of an apple green tint. It is necessary to have (1) a small amount of ferrous solution present at the time the indicator is added, (2) 10 per cent. sulphuric acid, (3) absence of nitric acid (except in traces).

"The Iodimetric Determination of Sugars" was the subject of a paper by Messrs. C. L. Hinton, F.I.C., and T. Macara, F.I.C. The authors explained that the aldoses, *e.g.* dextrose and lactose, are quantitatively converted to the corresponding monobasic acids by iodine in alkaline solution at ordinary temperature, provided the proportions of alkali and iodine to sugar are suitably controlled. The slight oxidation of sucrose and levulose found by other observers is confirmed, and the extent of this action is shown to depend considerably on time and temperature of reaction as well as on the proportions of iodine and alkali used. Using standard conditions it is possible to determine sucrose accurately in mixtures by titration before and after inversion, but the determination of other sugars is liable to be affected by non-sugar reducing substances. The method is so convenient, however, that it recommends itself technically for approximate determinations of invert sugars.

Gas Companies' Chemical Works

Alkali Manufacturers' Action

FROM time to time the Association of British Chemical Manufacturers has been instrumental in ensuring that the powers given by Parliament and Government Departments to gas undertakings in regard to the manufacture of chemicals have not been such as to prejudice the business of chemical manufacturers. This matter, however, is one which also comes within the sphere of other bodies whose business it is to safeguard chemical manufacturing interests, as was evidenced in an inquiry held last week by Mr. H. C. Honey (Director of Gas Administration at the Board of Trade) in regard to an Order which has been granted to the Wolverhampton Gas Company under the Gas Regulation Act, 1920. On this occasion it was the Alkali Manufacturers' Association which stepped in on behalf of the chemical industry, and asked for the insertion of the "model clause" restricting the chemical manufacturing activities of the Gas Company, but whether or not the application was successful is not yet known, because Mr. Honey has deferred his decision in order that he might consider the position carefully.

The point arose in regard to the transfer of two small pieces of land, one belonging to the Gas Company and the other to the Great Western Railway Company. The positions of these two pieces of land are such that it would be more convenient for the Railway Company and the Gas Company to exchange, and provision is made in the Gas Company's Order to carry this into effect. The powers for the acquisition of the land now in the hands of the Gas Company were obtained by them as far back as 1900, and they prohibited the Company from manufacturing chlorine or sulphuric acid thereon. Under the present Order this prohibition is to attach to the piece of land which the Gas Company is to receive from the Railway Company, but the Alkali Manufacturers' Association asked that the matter should be carried a step further. The model clause which the representatives of the Association asked should be inserted—and which has been inserted by Parliament in numerous gas Bills during the past few years—empowers the Gas Company to convert residual products arising from its own manufacture of gas, and to purchase and convert residual products arising from the manufacture of gas by other gas undertakings, but limits the quantity to be so purchased in any year to one-third the quantity of the like residual products arising from the manufacture of gas by itself during that period. Power is given also to purchase, either from gas undertakings or elsewhere, the materials required to convert the residual products, but it is provided that the Company shall not manufacture chemicals exclusively from raw materials purchased from sources other than gas undertakings, or in the manufacture of which the use of gas residual products is merely subsidiary.

The point of view adopted by the Gas Company is that the local people obtained all the protection they needed when the ground was acquired in 1900, and that there has been no change in the circumstances existing at that time. The Alkali Manufacturers' Association, however, hold that the Board of Trade is justified in inserting the clause, on the ground that the controversy as to the operations of gas undertakings in the manufacture of chemicals had not arisen in 1900.

Non-Ferrous Metallurgy

Professor Louis's Review of Fifty Years' Progress

THE winter session of the North East Coast (local section) of the Institute of Metals was commenced in Armstrong College, Newcastle, on Tuesday evening, when Professor Louis, who has succeeded Sir Charles Parsons in the Presidency of the Section, gave his opening address.

Professor Louis said it was practically half a century since he first began to take any interest in non-ferrous metallurgy, and it occurred to him that a review of the progress made in non-ferrous metallurgy in half a century might form a suitable subject for his address. The progress made up to half a century ago had been extraordinarily slow. Copper, lead and tin appeared to have been known to mankind from a very early stage in civilisation; but even in classical times there were no additions made to the list. Brass was used by the Romans, but nothing at all was known as to its real nature, and that ignorance continued through many centuries. Throughout the middle ages the scope of metallurgy was hardly widened at all, but about the middle of the eighteenth century, chemistry, and therefore scientific, methods began to be applied to metallurgy. However, there was nothing striking to chronicle until about the middle of the nineteenth century, when electrolitic refining added largely to the capacity of producing a number of non-ferrous metals.

Apart from these material results, very great steps had been made in the scientific understanding of the subject. It was fair to say that, fifty years ago, the scientific side of metallurgy was commencing, and that the scientific side was destined to bear great fruit within the half-century that followed. From the practical man's point of view, perhaps the most important thing to look at was the quantity of the metals available and the world's producing capacity. In 1873, the world's producing capacity was roughly: Copper, 160,000 tons per annum; lead, 270,000 tons; spelter, 120,000 tons; tin, 30,000 tons; whereas at the present day the figures were: Copper, 1,400,000 tons; lead, over 1,000,000 tons, probably 1,125,000 tons; spelter, 1,000,000 tons; tin, 120,000 tons; aluminium, 200,000 tons. They would see from those figures that the last half-century had been a half-century of intensive metallurgical work. Obviously enough, such increases could only be rendered possible by great improvements in the metallurgical processes employed in the extraction of those metals, and, necessarily, concurrently there were great improvements in the methods of mining the ores of those metals.

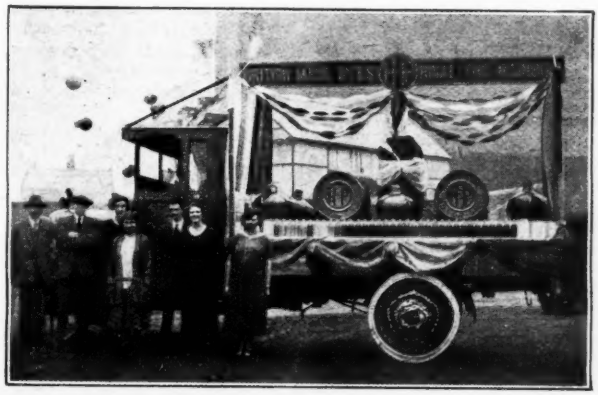
Professor Louis then briefly reviewed the changes in the methods of producing the various metals in the past half-century.

Society of Dyers and Colourists

THE first meeting of the Manchester Section for the Session 1923–4 was held on Friday evening, September 28, at the rooms of the Manchester Literary and Philosophical Society. Mr. William Marshall presided, and a paper was read by Dr. Julius Rath (of the Chemische Fabrik Griesheim-Elektron) on "Colloid-Chemical researches in connection with Naphthol A.S." He said that Naphthol A.S. and its homologues Naphthol A.S.–B.S., A.S.–B.O., A.S.–R.L., A.S.–S.W., showed in their behaviour fundamental differences from Beta Naphthol; the most remarkable of them being the substantivity or better absorption by the fibre. The researches of the author and his collaborator (Dr. Christ) showed that the alkaline solutions of the naphthols of the A.S. group formed colloidal solutions with the typical properties of these latter. Interesting relations existed in the various naphthols as regards molecular size, solubility, degree of dispersion and substantivity. The greater the molecule of a naphthol of the A.S. group the more difficult it was to dissolve in caustic soda; the smaller was its degree of dispersion, and the stronger its affinity to the cotton fibre. Increasing the temperature caused an increase of the degree of dispersion showing itself by a lesser substantivity. Addition of electrolytes lowered the degree of dispersion. The "ageing" typical for colloidal solutions could also be observed in the case of Naphthol A.S. solutions. The process was, however, somewhat complicated by a slow chemical action taking place between the formaldehyde which was usually added to the solutions and the naphthol itself. The ageing of naphthol solutions could easily be prevented by an addition of suitable protective colloids, such as Turkey Red oil and glue. The author gave, in conclusion, a summary of the special properties of the five different naphthols at present on the market.

A Pageant at Castleford

AN interesting display in aid of local hospitals was held at Castleford, Yorkshire, on Saturday, September 29. The main idea of the pageant was the connection between the town and the River Aire, illustrating the value of this river, which is navigable between Castleford and Goole and Hull for large barges, to the industries in the town. The local collieries



made the biggest display, representing, of course, the main industry of the district. Chemical industry was represented by the Castleford and Whitwood Gas Co., and Hickson and Partners, Ltd. Messrs. Hickson and Partners' lorry was attractively decorated with chemicals, coloured solutions, and fabrics of all shades illustrating the intimate connection between the mining industry and dyestuff production.

Improved Trade in September

A SUMMARY of the overseas trade returns for September, issued by the "Board of Trade Journal," reveals an improvement in exports and re-exports as compared with August, the former having risen by £3,733,000 and the latter by £1,981,000. Imports, on the other hand, declined by £5,477,000, due mainly to a heavy fall under the head of foodstuffs. The totals for the two months compare as follows:

	August.	September.
Imports	£88,743,197 ..	£83,265,581
Exports	£60,103,360 ..	£63,836,144
Re-exports ..	£6,128,781 ..	£8,110,443

The monthly average value of imports for the third quarter of the year was £82,942,371, and that of exports was £61,147,785. For the second quarter the corresponding values were £88,400,192 and £65,769,842 respectively.

Dyestuff Licences for September

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during September has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee:—

The total number of applications received during the month was 457, of which 311 were from merchants or importers. To these should be added the 34 cases outstanding on September 1, making a total for the month of 491. These were dealt with as follows: Granted, 342 (of which 300 were dealt with within seven days of receipt); referred to British makers of similar products, 79 (of which 65 were dealt with within seven days of receipt); referred to Reparation supplies available, 30 (all dealt with within two days of receipt); outstanding on September 30, 1923, 40 (all dealt with at meeting of the Committee held on October 5). Of the total of 491 applications received 395, or 80 per cent., were dealt with within seven days of receipt.

From Week to Week

THE AMERICAN INSTITUTE OF CHEMISTS is to be the new title of the Institute of Chemistry which was started in the States nine months ago. It has been decided to apply for the official incorporation of this association under the laws of the State of New York.

DURING A VISIT last week by the Hull Association of Engineers to the wallpaper manufactory of J. Slather and Son, Hull, the colour-mixing house, with its mixers, marble rollers and artificial daylight apparatus for preparing and examining pigments, attracted much interest.

A BILL was recently passed in the Australian House of Representatives providing for the appropriation of £100,000 each year from which is to be paid a bounty of £2 5s. per ton on all sulphur produced in Australia from Australian pyrites and other sulphide ores or concentrates.

THE ANNUAL DINNER of the Chemical Industry Club has been fixed to take place at the Connaught Rooms, London, on Friday, November 23. Several men prominent in the chemical industry will be present. Tickets (15s.) may be had from members or from the secretary.

THE BOARD OF TRADE announce that they have appointed Dr. A. T. de Mouilpied, of the British Dyestuffs' Corporation, Ltd., to be a member of the Dyestuffs Industry Development Committee set up under Sub-section 2 (6) of the Dyestuffs (Import Regulation) Act, 1920, in the place of Dr. Herbert Levinstein, F.I.C., resigned.

THE CHILEAN NITRATE COMMITTEE announce that they are specially authorised by the directorate of the Chilean Nitrate Producers' Association to contradict the report to which wide circulation has been given that a reduction in the scale of official prices is under discussion. The directorate state that there is absolutely no basis whatever for such a report, and no change in prices is or has been contemplated.

SIR ALAN HUTCHINGS (director of South Yorkshire Chemical Works, Ltd., Modern Transport Co., Ltd., and North British and Mercantile Insurance Co. (Local)) has joined the board of Benzol and By-Products, Ltd. Mr. J. A. Davy (vice-president of the Yorkshire Coke Owners' Association, and formerly president of the Coke-Oven Managers' Association) has been appointed general manager of the company's colliery and works.

A RATHER SERIOUS FIRE occurred at the tarmac works of Constable, Hart and Co., The Saltwells, on the boundary of Dudley and Brierley Hall on Wednesday, October 3. There was a leakage of tar from a tank containing 2,000 gallons; the stream became ignited and in trying to extinguish the flames three men were burned. Ultimately the tar stream was directed to a field, and there the fire was gradually "smothered" by the liberal use of sand.

AN EXPLOSION which proved to be disastrous took place at the American Bureau of Standards on September 20, when four research workers were killed and three more injured. The research under way was concerned with the comparative tests of internal combustion engine fuels of differing volatility. The explosion was caused by the ignition of a mixture of vapour and air in the altitude chamber, a concrete enclosure in which the actual running of the engines was carried on.

THE FIFTH of the series of public lectures on "Physics in Industry," under the auspices of the Institute of Physics, will deal with "Physics in the Textile Industries." The lecture will be delivered by Dr. A. E. Oxley, physicist to the British Cotton Industries' Research Association, at the Institution of Electrical Engineers, London, on Monday, October 22, at 5.30 p.m. The chair will be taken by Sir Charles Parsons, F.R.S., who has just succeeded Sir J. J. Thomson as President of the Institute.

MANCHESTER MERCHANTS on Wednesday passed a resolution regretting the refusal of the Piece Dyers' Association to withdraw their offer to give a rebate conditionally on all orders being placed with members of the Association. The merchants further declined to accept the alternative scheme, and requested the Shipping Merchants Committee of the Manchester Chamber of Commerce to intimate to the Piece Dyers Association that goodwill could only be restored by withdrawal of the obnoxious proposals.

DR. LEVINSTEIN'S ADDRESS as chairman of the Manchester Section of the Society of Chemical Industry on "Recent Progress in Chemistry," is the first of a series of addresses to be given by him on similar subjects. Last evening (Friday) at Bolton he spoke on "The British Colour Industry" before the Manchester Junior Section of the Society of Dyers and Colourists. Next week he leaves for Paris as a guest of the Société de Chimie Industrielle and while there will speak at the invitation of the society. On November 29 he will address the West Riding Section of the Society of Chemical Industry in Bradford.

THE WELL-KNOWN French dye firm, the Compagnie Nationale des Matieres Colorantes, has absorbed the Kuhlmann Co., of Lille, which was formerly a large individual producer of dye bases. The Compagnie Nationale has also absorbed the Lens Co., which owns coal mines, and produces intermediaries. The Kuhlmann stock is being increased by 50,000,000 francs. The new acquisition is regarded as important, as it means the development of a powerful French combine. This is regarded as significant at the present time, because of the existing impression that France hopes to eventually acquire some German dye factories in the Ruhr.

THE NATIONAL GAS EXHIBITION at Bingley Hall, Birmingham, which came to an end last week, attracted over 80,000 visitors. On the business side, the results were considered generally satisfactory, particularly in relation to equipment for gas manufacture and residuals. An appeal was made to the gas industry by Mr. D. Milne Watson (President of the National Gas Council) for support of the section at the British Empire Exhibition at Wembley next year. Mr. H. Wade Deacon, chairman of the Liverpool Gas Company, is the new President of the British Commercial Gas Association, and next year's Conference will take place at Liverpool.

THE OPENING MEETINGS of the Yorkshire branch of the Institute of Mechanical Engineers were held on Thursday, October 4, at Sheffield, and on the following day at Leeds. The meetings were well attended. The chair was taken by Mr. Fred Clements, and at each meeting a paper was read by Sir James Kemnal, F.R.S.E., on "Modern Developments in Steam Raising and Crane Construction." Attention was drawn to a noteworthy installation, in which a steam pressure of 800 lb. per square inch is utilised in a specially designed turbine before passing to the main power plant. The apparent increase in efficiency obtained in this way was rather discredited, however, in some remarks by Mr. Clements on recent results in a similar American power station.

CONSIDERABLE PROGRESS has been made in the preparations for the World Power Conference to be held at the British Empire Exhibition, Wembley, from June 30 to July 12, 1924, under the presidency of the Earl of Derby. The conference is being promoted by the Council of the British Electrical and Allied Manufacturers' Association, in co-operation with technical and scientific institutions and industrial organisations in Great Britain and other countries, for the purpose of considering how the industrial and scientific sources of power may be adjusted nationally and internationally. A number of papers have been arranged on power development and generation, standardisation, and public education on these questions by well-known authorities. There is a chemistry and physics section under the secretaryship of Mr. H. Talbot, who is representing the Chemical Engineering Group of the Society of Chemical Industry.

AT GLASGOW SHERIFF COURT on Tuesday a fine of £10 was imposed on the Midlothian Chemical Co., Ltd., for having in premises in Dundas Street, sold a food preservative which contained 200 parts per million of arsenic, whereas it should not contain more than five parts per million. Mr. George Smith, Procurator-Fiscal, stated that the preparation was used as a preservative for certain milk products. The amount of arsenic contained therein should not be more than five parts per million. A sample of the preservative in question contained 40 times the permissible maximum. An agent who appeared on behalf of the respondents explained that they were not manufacturing chemists. The preservative was bought from a firm of manufacturing chemists in the city and the respondents had no knowledge of the presence of arsenic in it. They had ceased to purchase the preservative from the firm who had been supplying it, and were getting it from another source, guaranteed pure.

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Abstracts of Complete Specifications

203,352. TITANIC ACID, PRODUCTION OF. C. Weizmann and J. Blumenfeld, 16, Addison Crescent, London, W.14. Application date, March 1, 1922.

The object is to obtain titanium oxide free from iron and other impurities, for use as a pigment. Titaniferous ore, *e.g.*, ilmenite is treated with sulphuric acid of 90 per cent. strength at about 170° C. rising to 200° C. The product consists of ferrous and ferric sulphates, basic titanium sulphates, and unchanged mineral. This mixture is treated with water added slowly at a temperature below 50° C., in such quantity that most of the iron sulphate remains undissolved. The ferric salts are reduced during the extraction by means of spongy iron, to avoid any hydrolysis of the trivalent iron salt. The solution may then be filtered and contains a proportion of titanium oxide to iron oxide of about 6 : 1. The sulphate of iron mixed with the unchanged mineral may be dissolved and crystallised, and may be treated to recover sulphuric acid, or otherwise used. The titanium sulphate solution is then hydrolysed and the titanium hydroxide precipitate washed to remove traces of iron. The water should be acidulated with sulphuric acid, and a small quantity of trivalent titanium salt added to prevent any oxidation of the divalent iron salts in the liquor. The washing is continued until no iron is present in the water. The presence of organic substances in the titanium hydroxide may affect the colour of the final product. When the hydroxide is calcined, some reduction from TiO_2 to Ti_2O_3 occurs, and the latter darkens the whiteness of the product. To prevent this, the titanium hydroxide is calcined at a temperature of 850°–900° C. under oxidising conditions by blowing air through it.

203,354. OILS, PURIFICATION OF. H. M. Ridge, 2, Great Winchester Street, London, E.C.2, and W. R. Hodgkinson, 89, Shooter's Hill Road, London, S.E.3. Application dates, March 4, May 22, and June 26, 1922.

In the purification of oils to remove sulphur by means of metals such as copper, zinc, cadmium and iron, it has been found that the affinity of these metals for sulphur depends on the presence of an oxide or a chloride of the metal. When using copper as the purifying metal, it may be obtained together with the necessary copper oxide by superficially reducing the oxide. Alternatively, the copper may be mixed with a halide or oxyhalide, particularly the subchloride of copper. The material may be used as a filtering medium for the oil, or it may be agitated with the oil, or the vaporised oil may be passed through a column of the subdivided material. In an example, copper turnings or filings are heated for a short time in air until they become coated with oxide. The copper may then be passed, before it has absorbed moisture from the atmosphere, into a drum containing the oil, which is agitated until the required purification is obtained. The purifying material may be distributed over the surface of a material such as pumice or bauxite by impregnating the latter material with copper acetate solution, and heating it to obtain a mixture of copper and copper oxide. Several other examples are given of the use of copper with copper oxide or cuprous chloride.

203,383. REFINED COPPER FROM COPPER OXIDE, PRODUCTION OF. W. G. Perkins and W. H. Beasley, 62, London Wall, London, E.C.2. Application date, June 2, 1922.

The object is to obtain refined copper from finely divided copper oxide. The copper oxide may be obtained as described in Specification No. 185,242 (see THE CHEMICAL AGE, Vol. VII, p. 503) by reducing a copper ore in a reducing gas at a low temperature without melting or alloying the copper, leaching the product with an ammoniacal solvent in the presence of air, and boiling the solution to precipitate the copper oxide. If the copper oxide is reduced to copper, and the latter introduced into a refining furnace, some of the copper is carried away as dust, and some reoxidation takes place, so that the oxidised particles do not readily fuse together. In the present invention, the finely divided copper oxide is reduced and the copper cooled in a reducing atmosphere, and pressed into cakes or blocks without the use of any binder. In an example, an ore containing malachite and chrysocolla is crushed and reduced at 400°–500° C. without melting the copper or fritting the gangue. This product is leached with ammoniacal solvent in the presence of air, and the solution treated in a distillation apparatus to remove the ammonia and to precipitate the copper oxide. The oxide is reduced to copper in a muffle furnace below 500° C., and the finely divided copper briquetted at a pressure of 1·5 to 2 tons per square inch. These blocks are then passed into a refining furnace, and their small surface reduces the loss from dusting or oxidation to a minimum.

203,519. WHITE OXIDE OF ANTIMONY, PROCESS OF MANUFACTURE OF. A. Germot, 56, Avenue de la Marne, Asnières, Seine, France. Application date, September 8, 1922.

White oxide of antimony (Sb_2O_3) is manufactured for use as a pigment by blowing air through a bath of pure molten antimony. The antimony is melted at a temperature of about 800° C., in an electric furnace, and the heating is then discontinued and air is blown through the antimony. The reaction is sufficiently exothermic to maintain the antimony in fusion, and the vapour of antimony oxide is continuously drawn off to a condensing chamber. The draw-off conduit preferably dips into the antimony in a closed reaction chamber, and the air inlet pipe terminates in the antimony within the draw-off pipe. Means are provided for introducing fresh antimony without opening the reaction chamber to the air.

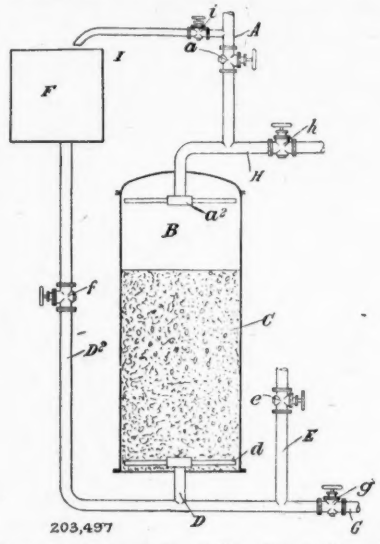
203,533. DYESTUFFS, MANUFACTURE AND PRODUCTION OF, AND INTERMEDIATE PRODUCTS THEREFOR. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, September 19, 1922.

Benzanthrone or its derivatives are treated with alkaline condensing agents under more moderate conditions than are used for the manufacture of colouring matters by alkali fusion ; the temperature may be lower, the time of treatment shorter, and the condensing agent less concentrated. The products may be regarded as 2 : 2^1-dibenzanthronyls, and are useful intermediates for the production of colouring matters. The intermediates may be converted into dibenzanthrone colouring matters by condensation, which may be effected by heating, or by the use of condensing agents of an acid or alkaline nature, or which are weakly oxidising. If free halogens or sulphuric acid or other halogenating or sulphonating agents which are also condensing agents are used, the corresponding derivatives of dibenzanthrone are produced. If strong oxidising agents are used, oxidised dibenzanthrone is formed. Examples are given of the treatment of benzanthrone with potassium hydroxide and ethyl alcohol at 100° C. to obtain an intermediate, which gives a yellow solution in nitro benzene, or trichlorbenzene, and a red solution in concentrated sulphuric acid. Several other examples using different condensing agents are given.

203,497. REGENERATING BASE-EXCHANGING COMPOUNDS AFTER USE, PROCESS OF. T. P. Hilditch, Birchdene, Cross Lane, Grappenhall, Cheshire; H. J. Wheaton, 5, Walton New Road, Lower Walton, near Warrington ; and Joseph Crosfield and Sons, Ltd., Warrington, Lancs. Application date, August 14, 1922.

When water has been softened and purified by means of base-exchanging compounds of the sodium silicate or sodium-silicate-aluminate type, the compound has been regenerated by passing a solution of sodium chloride through it. The calcium and magnesium absorbed by the compound are thereby converted into chlorides which may be washed out, and sodium is substituted for the calcium and magnesium. It has now been found that the greater part of the lime and magnesium are removed by the first portions of the brine, the remainder of the calcium and magnesium requiring a relatively large proportion of brine. In this invention, the brine first passed through the compound is used as the first regenerating solution for a subsequent operation, and the second part of the purification is effected with fresh brine, thus employing a smaller quantity of brine. Water to be treated passes through a pipe *A* and distributor a^2 to the base-exchanging compound *C*, and is discharged by the pipes *D*, *E*. To regenerate the compound the valves *a*, *e* are closed, and the valve *f* opened, allowing previously used brine from the tank *F* to pass

through the pipes D^2, D to the vessel B, displacing water through the pipe H. The valves f, h are then closed, and fresh brine is passed from the tank F through pipes D^2, D into the vessel B, displacing the spent brine through the pipe H to waste. The valve h is then closed and the valve a opened, and water is admitted to the vessel B to displace the partly



203,497

used brine back to the tank F. When this is done the valve g is opened and the water allowed to flow through to waste until it is free from brine. The purification then proceeds as before. The apparatus may be modified by providing two tanks, such as F, for fresh and partly used brine.

203,551. NITRATE OF LIME. R. B. Hovey, Fernside, Wheelock, Landbach, Cheshire, and E. L. Hovey, Norwood, Landbach, Cheshire. Application date, October 5, 1922.

To facilitate its use in agriculture, nitrate of lime is mixed with 2½ per cent. upwards of finely ground brick or slate dust which has been calcined or dried, or with calcined gypsum. The nitrate of lime is thus maintained in powder form.

203,608. N-MONO- AND DI-CARBOXYLIC ACID ESTERS OF ASYMMETRICALLY SUBSTITUTED ALKYLENEDIAMINES. O. Y. Imray, London. From Society of Chemical Industry in Basle, Switzerland. Application date, December 30, 1922.

A solution of an asymmetrically substituted alkylene diamine—*e.g.*, *as*-diethyl-ethylene-diamine, is mixed with an equi-molecular proportion of an ester of a halogen-formic acid, *e.g.*, the benzyl ester of chloroformic acid, yielding the hydrochloride of a basic urethane. If two molecular proportions of the chloroformic acid ester are used, or the urethane is treated with a further molecular proportion, the corresponding iminodicarboxylic acid ester is obtained. The free bases may be obtained from the hydrochloride by adding caustic soda lye, and are oils insoluble in water, but soluble in most organic solvents. These compounds are used for therapeutical purposes, and several examples of their preparation are given.

203,506. DISTILLING AND FRACTIONATING COLUMN. A. L. Bloomfield, 185, Buckhurst Hill, Essex, and A. Boake, Roberts and Co., Ltd., Carpenters Road, Stratford, Essex. Application date, August 22, 1922.

The apparatus is for the continuous separation of three or more components of a liquid mixture. In the usual process for distilling a mixture of two components, A and B, of a mixture in a fractionating still, the liquid A may be obtained pure at the bottom of the still, and the vapour B at the top. If there are three components, A, B and C, A and C may be obtained pure at the bottom and top respectively, but the middle portion, though rich in B, contains A and C in addition. This is avoided in the present invention by arranging that each component in turn forms one of the extremes of the series of components remaining.

Each unit a, b, c (Fig. 1) of a number of superposed units, is provided with a boiling or analysing portion a^1, b^1, c^1, and a rectifying portion a^2, b^2, c^2. The rectifier of each unit encloses the lower or analysing part of the unit next above, so that the vapour in the upper part of the lower unit supplies heat to the lower part of the upper unit. The exact amount of condensation or evaporation is controlled by supplementary heat exchangers 3. The separated components are withdrawn in liquid form from the bottom of each component by pipes 7, and the purified vapour is drawn off at the top by a pipe 10. Vapour passes upwards from each unit to the next through short pipes covered by hoods 9, to prevent the downward passage of liquid. This apparatus is arranged to separate the various components as liquids, but it may be modified as shown in Fig. 2 for separating them as vapours. In this case, vapour draw-off pipes 10 are provided at the top of each unit, and the heat interchangers 3 are at the bottom of each unit to ensure evaporation. The connecting pipes 11 allow

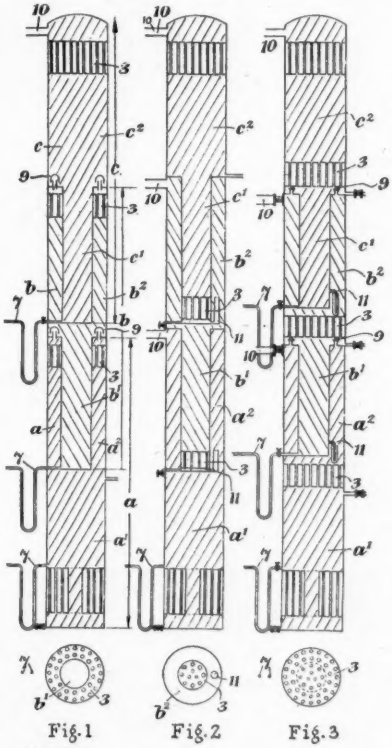


Fig.1 Fig.2 Fig.3

203,506

the passage of liquid only. If both series of pipes 7 and 10 are provided, as in Fig. 3, either method may be used as desired. Several kinds of heat interchangers are described, and several kinds of internal construction of the units.

203,632. ROTARY PULVERISERS. A. Squassi, 31, Corso Magenta, Milan, Italy. Application date, March 24, 1923.

The material is pulverised by means of rotary beaters or hammers mounted on a horizontal shaft, in a casing having grinding jaws arranged concentrically. The same shaft carries a fan, which is supplied with air from a separate inlet, and the powdered material is carried upwards by the air-current to a separating chamber having a screen which separates the finer material and returns the coarser material to the pulveriser.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—189,419 (J. Gradl), relating to fertilisers, see Vol. VIII, p. 127.

International Specifications not yet Accepted

201,922. ZINC SULPHIDE. Allchemin Allgemeine Chemische Industrie Ges., 73, Troststrasse, Vienna, and R. Jahoda, 86, Grinzingerstrasse, Vienna. International Convention date, August 2, 1922.

To obtain phosphorescent zinc sulphide, zinc is dissolved in hydrochloric acid, using an excess of zinc. Iron is separated from the solution by oxidising with bromide or permanganate,

an alkali hydrate, carbonate, or an alkaline earth. Zinc sulphide is precipitated by an alkali sulphide, sulphuretted hydrogen ammonium sulphide, barium sulphide, or strontium sulphide. The zinc sulphide is dried and calcined in a closed vessel at 1,000° C.

201,927. STANNIC CHLORIDE. Buss Akt.-Ges., 24, Aeschangraben, Basle, Switzerland. International Convention date, August 4, 1922.

Stannic chloride is produced by passing chlorine over tin ingots packed in a slightly inclined retort, cooled by a water jacket. The gas is drawn through washers to a vacuum pump.

201,940–1. LAKES. W. Eberlein, Kochel, Upper Bavaria, Germany. International convention date, August 6, 1922. 201,941 addition to 201,940.

201,940. Colour lakes are formed from basic dyestuffs and colloidal aluminium silicates, by mixing with a quantity of water insufficient to dissolve the dyestuff, and heating with or without pressure. An auramine lake is described.

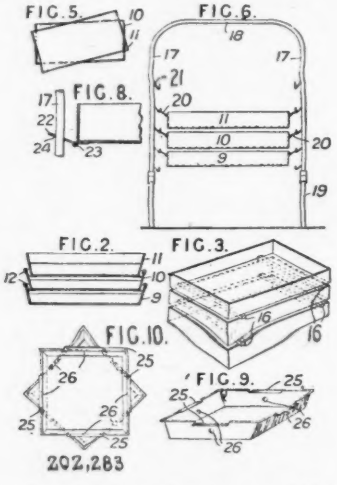
201,941. In a process as in 201,940, base exchanging silicates such as zeolite and permutite may be employed as the substrata, but they need not be colloidal.

201,942. CHROMIUM SULPHATE, CHROME ALUM. Jucker and Co., Chemische Fabrik, Haltingen, Baden, Germany. International Convention date, August 7, 1922.

Chromium residues obtained in dyestuff manufacture are dissolved in sufficient sulphuric acid to convert all the chromium to sulphate or basic sulphate, and then treated with potassium or ammonium dichromate and potassium or ammonium sulphate to obtain a chrome alum.

202,283. SULPHUR BURNERS AND SULPHUR DIOXIDE. Texas Gulf Sulphur Co., Inc., 41, East 42nd Street, Manhattan, New York. Assignees of W. H. Kobbé, 41, East 42nd Street, Manhattan, New York. International Convention date, August 8, 1922.

Sulphur, particularly that which contains oil, is burned in superposed layers which are sufficiently close for the heat of combustion of one layer to be transmitted to the next layer.



The sulphur is contained in trays 9, 10, 11, which are stacked one upon the other by means of hooks 12, Fig. 2, or by spacing rods 16, Fig. 3. Alternatively the trays may be provided with handles 20, Fig. 6, which engage hooks 21 on a frame 17, 18, 19. Instead of handles, plates 22, Fig. 8, hinged at 23 to the tray, may be used. Each plate has an opening 24, so that it may slide over the column 17, and the tray remains in any desired position by means of the binding of the plate 22 on the column 17. The combustion may be terminated by lowering the trays into contact with one another. Alternatively, the trays may be slightly displaced angularly as shown in Figs. 5 and 10, and recesses 25 may be provided in the sides to facilitate the stacking. Holes 26, Fig. 9, may be provided to allow the molten sulphur to pass downwards through the series when fed to the uppermost tray.

202,263. SOAPS. T. Legradi, 6, Loquaiplatz, Vienna. Assignee of I. Wieninger, 2, Haslangstrasse, Munich, Germany. International Convention date, August 8, 1922.

Fat is saponified with caustic liquor in presence of excess of fat or unsaponifiable organic or mineral fat-like substances, such as paraffin oil, vaseline, wool fat, stearine, oleine from wool fat, beeswax, and paraffin, ceresin, montan or japan wax. The mixture is subjected to prolonged heating and stirring until all water is expelled, yielding a dehydrated hard soap of large resin or potash content.

202,264. MOTOR SPIRIT. H. Terrisse, 88, Rue de St. Jean, Geneva. International Convention date, August 12, 1922.

Motor spirit is made by mixing acetal, paraldehyde, or acetaldehyde with alcohol, petroleum, or the 80°–340° C. distillate from coal tar or tar obtained from schist, lignite, peat or wood.

LATEST NOTIFICATIONS.

204,697. Process of dehydration of alcohol for carburants. Soc. Ricard, Allenet et Cie. September 30, 1922.

204,721. Manufacture of arseno-benzene derivatives. Farbwerke vorm. Meister Lucius and Brüning. September 29, 1922.

204,722. Manufacture of diaminodiaryl-dialkylmethanes. Farbwerke vorm. Meister, Lucius & Brüning. September 29, 1922.

Specifications Accepted, with Date of Application

192,376. Alkylation and aralkylation of carbazol. National Aniline and Chemical Co., Inc. January 25, 1922.

195,649. New Azo dyes, Manufacture of. Farbenfabriken vorm. F. Bayer and Co. April 3, 1922.

197,319. Benzaldehyde and benzoic acid, Production of. Carbide and Carbon Chemicals Corporation. May 4, 1922.

197,690. Cyanamide, Process for manufacturing manures containing soluble organic nitrogen from. Soc. d'Etudes Chimiques pour l'Industrie. May 5, 1922.

203,709 and 204,290. Chromates and bichromates, Manufacture of. A. J. B. Jouve, A. Helbronner and Soc. Hydro-Electrique and Metallurgique du Palais. November 23, 1921, and March 17, 1922.

204,078. Liquid hydrocarbons, Treatment of. A. E. Dunstan. April 22, 1922.

204,093. Paints, Manufacture of. S. R. Trevor and J. E. Moosman. June 12, 1922.

204,108. Dyestuffs containing sulphur, Production of. R. B. Ransford. (*L. Cassella and Co., Ges.*) June 19, 1922.

204,179. Cellulose acetates, Dyeing of. R. Clavel. July 28, 1922.

204,196. Separation of one or more constituents of liquid mixtures, Process for. British Cellulose and Chemical Manufacturing Co., Ltd., and W. Bader. September 6, 1922.

204,223. Lead arsenate, Process for the manufacture of. I. McDougall and F. Howles. October 13, 1922.

204,241 and 204,249. Vat colouring matters, Manufacture and production of. J. Y. Johnson. (*Badische Anilin and Soda Fabrik*). November 27, 1922, and December 16, 1922.

204,250. Disintegrating or pulverising apparatus. J. E. Kennedy. December 18, 1922.

204,280. Dyeing cellulose esters. J. Y. Johnson. (*Badische Anilin and Soda Fabrik*). April 5, 1923.

Applications for Patents

Angel, E. G. R. Manufacture of table salt in conjunction with electrolysis of salt solutions. 24,911. October 6. (Sweden, October 6, 1922.)

Beilby, G. T. Electrolytic cells with mercury electrodes. 24,566. October 3.

Calderwood, W., and Webb, A. E. Process for making drying oils from mineral oils, etc. 24,853. October 5.

Dutt, W. Removal of impurities from manganese ores. 24,558. October 3.

Farbenfabriken vorm. F. Bayer & Co. Manufacture of silica acid gels. 24,495. October 2. (Germany, October 4, 1922.)

Frink, R. L. Producing alumina and glass-making salts. 24,711. October 4.

King, P. H., and Wright, C. H. Method of retarding oxidisation in gums and resins. 24,367. October 1.

Kohlenveredlung Ges. Distillation of carbonaceous substances. 24,847, 24,848. October 5. (Germany, October 5, 1922.)

Lockhart, W. S. Centrifugal separators. 24,381. October 1.

Malmsten, N. K. E. Apparatus for disintegrating, etc., artificial fertilisers. 24,403. October 1.

Merz and McLellan, and Weekes, E. G. Low-temperature fuel distillation. 24,632. October 3.

Monterumici, R. Preparation of magnesia hydrate. 24,477. October 2. (Italy, October 3, 1922.)

Scottish Dyes, Ltd., and Thomas, J. Manufacture of quinizarine, etc. 24,609. October 3.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, October 11, 1923.

THERE has been a decided improvement in trade during the past week and hopes are expressed in some directions that this is the forerunner of a period of greater prosperity. There are not many price movements to report, but most markets are healthier.

Export demand is small and presents no special feature.

General Chemicals

ACETONE remains a firm market. Demand is nominal.

ACID ACETIC has been in good demand, price is maintained.

ACID CITRIC is very slow of sale. Second-hand market is below makers' price.

ACID LACTIC is unchanged.

ACID OXALIC is only in moderate demand, but stocks are firmly held at present prices.

ACID TARTARIC is in poor demand, even for the off season. Makers claim that present prices are below cost, and are not likely to be reduced.

BARIUM CHLORIDE is unchanged.

CREAM OF TARTAR has been in rather better demand; price is a little firmer.

FORMALDEHYDE is in good request. Spot supplies are on the small side.

LEAD ACETATE is in fair demand, and is firm in price.

LEAD NITRATE is unchanged.

POTASSIUM CARBONATE demand is nominal.

POTASSIUM CAUSTIC is slow of sale—price nominally unchanged.

POTASSIUM PERMANGANATE is in fair inquiry.

POTASSIUM PRUSSIATE.—There is perhaps a slight improvement in demand, but the tendency tends in buyers' favour.

SODIUM ACETATE is firm in price and in fair demand.

SODIUM HYPOSULPHITE without special feature.

SODIUM PRUSSIATE.—Price, so far as can be seen, has touched bottom and an improvement in price is not unlikely.

SODIUM SULPHIDE is unchanged.

ZINC SALTS are only in fair demand, values generally unchanged.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID has been in good demand, the advanced price being readily paid for the best brands.

ACID SALICYLIC has a firmer tendency, spot supplies being none too plentiful.

BARBITONE has been in moderate demand, with the price rather weaker.

BROMIDES are rather more active and price is inclined to harden, although there are apparently considerable supplies, especially of the potassium salt, in second hands. The Continental makers' prices are considerably higher than those at which present stocks are being sold.

GUAIACOL CARBONATE is firmer, cheaper stocks having been largely disposed of.

HEXAMINE active and firm.

LITHIA CARBONATE has been in request, price unchanged.

MILK SUGAR firm and expected to advance.

PHENAZONE is active, with considerable export demand.

SODA SALICYLATE.—A good business is reported, higher prices for both powder and crystals being readily paid for the leading makes.

Coal Tar Intermediates

The Home Market has been of moderate interest during the current week, with fair inquiries for export account, although there is nothing of special feature to report.

ALPHA NAPHTHOL continues firm at last quoted prices.

ALPHA NAPHTHYLAMINE is steady with small business passing.

ANILINE OIL AND SALT.—These have been inquired for on home account.

BENZIDINE BASE continues in fair demand.

BETA NAPHTHOL continues on quiet lines.

DIPHENYLAMINE continues very firm, and some export inquiries have been received.

DIMENTHYLANILINE is without special feature.

NAPHTHIONATE OF SODA continues in demand, the price being unchanged.

NITRO BENZOL unchanged.

METAPHENYLANEDIAMINE has been in small demand.

PARANITRANILINE is without interest, the price being unchanged.

PARAPHENYLENEDIAMINE inquiries have been received on export account.

Coal Tar Products

There is no great change in the market in coal tar products from last week.

90% BENZOL is in poor demand for export, and works in the neighbourhood of the coast are fairly well sold, although the level of price is not high. The value remains at about 1s. 4d. per gallon on rails.

PURE BENZOL is in no great demand, and is quoted at 1s. 7d. to 1s. 8d. per gallon on rails.

CREOSOTE OIL is, if anything, a shade easier, and is worth about 8¼d. to 8⅜d. per gallon in the North, while in the South the price is about 9¼d. to 9⅜d. per gallon on rails.

CRESYLIC ACID remains unchanged, the pale quality 97/99% being worth from 1s. 10d. to 2s. per gallon on rails, while dark 95/97% is quoted at about 1s. 7d. to 1s. 8d. per gallon on rails.

SOLVENT NAPHTHA has a moderate inquiry for export, which has rather improved the position, although the price still remains at about 1s. per gallon on rails.

HEAVY NAPHTHA is quiet at 1s. 1d. to 1s. 2d. per gallon on rails.

NAPHTHALENES are unchanged from last week, the value of the low quality being from £6 10s. to £7 per ton, while 74/76 is worth from £7 10s. to £8 per ton, and 76/78 quality is worth about £8 10s. to £9 10s. per ton on rails.

PITCH.—There is a better demand both for prompt and for forward delivery, and prices have an upward tendency. To-day's approximate values are: 135s. to 140s. per ton, f.o.b., London; 130s. to 135s. per ton, f.o.b., East and West Coast.

Sulphate of Ammonia

The demand is fairly well maintained, but in some instances somewhat lower prices have been accepted.

[Current Market Prices on following pages.]

The Prices of Japanese Products

GENERALLY lower prices in Japanese products are considered possible by American chemical merchants, one of whom states that everyone agrees that items which originate in Japan are highly speculative, and in order to maintain their position in the market holders are obliged to borrow heavily from the banks. With the more pressing need of money to assist in the reconstruction of the devastated areas, it can readily be assumed that funds available for this purpose will be restricted. When this condition occurs, speculative holders will undoubtedly be forced to throw their goods on the market, and prices will probably recede to a considerable extent. With the exception of one or two articles, present quotations for Japanese products are about on the same level as prior to the earthquake.

Menthol is the best example, and this item is being held at a high price owing to uncertainty of the stocks in Yokohama. Insect flowers, camphor, and agar agar are quoted for shipment at about the same prices as before the disaster. The high price of Japan wax is credited to the rumour that the Japanese Government is using present supply of wax to manufacture into candles which are to be utilised in place of the lighting systems that were reported destroyed.

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	4	to	0	1	5
Acetone oil	ton	80	0	0	to	85	0	0
Acetone, pure	ton	127	10	0	to	130	0	0
Acid, Acetic, glacial, 99–100%	ton	73	0	0	to	74	0	0
Acetic, 80% pure	ton	49	0	0	to	50	0	0
Acetic, 40% pure	ton	25	0	0	to	26	0	0
Arsenic, liquid, 2000 s.g.	ton	85	0	0	to	88	0	0
Boric, commercial	ton	48	0	0	to	52	0	0
Carbolic, cryst. 39–40%	lb.	0	1	1½	to	0	1	2½
Citric	lb.	0	1	5	to	0	1	5½
Formic, 80%	ton	50	0	0	to	51	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	39	0	0	to	40	0	0
Lactic, 60 vol.	ton	44	0	0	to	46	0	0
Nitric, 80 Tw.	ton	26	0	0	to	27	0	0
Oxalic	lb.	0	0	6½	to	0	0	6½
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, technical	lb.	0	1	9	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	1½	to	0	1	2
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	ton	30	0	0	to	32	0	0
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	35	0	0	to	37	10	0
Nitrate (pure)	ton	35	0	0	to	40	0	0
Phosphate	ton	65	0	0	to	68	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate, technical	ton	280	0	0	to	300	0	0
Arsenic, white powdered	ton	65	0	0	to	68	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	15	10	0	to	16	0	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	0	11	to	0	1	0
Bleaching powder, 35–37%	ton	10	7	6	to	10	17	6
Borax crystals, commercial	ton	25	0	0	to		—	
Calcium acetate, Brown	ton	13	0	0	to	14	0	0
Grey	ton	22	0	0	to	23	0	0
Carbide	ton	13	0	0	to	13	10	0
Chloride	ton	5	15	0	to	6	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	100	0	0	to	105	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	1	to	0	1	2
Sulphate	ton	25	10	0	to	26	0	0
Cream Tartar, 98–100%	ton	86	0	0	to	88	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	73	0	0	to	74	0	0
Formusol (Rongalite)	lb.	0	2	1	to	0	2	2
Glauber salts, commercial	ton	4	0	0	to	4	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal	0	2	0	to	0	2	1
Iron perchloride	ton	18	0	0	to	20	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	41	0	0	to	42	0	0
Carbonate (White Lead)	ton	43	0	0	to	45	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	37	0	0	to	39	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	3	10	0	to	3	15	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	5	15	0	to	6	0	0
Sulphate (Druggists')	ton	8	0	0	to	9	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	45	0	0	to	50	0	0
Methyl acetone	ton	82	0	0	to	85	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	37	0	0	to	38	0	0
Ammonium sulphate, double salt	ton	37	0	0	to	38	0	0

	Per	£	s.	d.		£	s.	d.
Potash, Caustic	ton	30	0	0	to	32	0	0
Potassium bichromate	lb.	0	0	5½	to	0	0	6
Carbonate, 90%	ton	30	0	0	to	31	0	0
Chloride, 80%	ton	9	0	0	to	10	0	0
Chlorate	lb.	0	0	3½	to		—	
Metabisulphite, 50–52%	ton	65	0	0	to	70	0	0
Nitrate, refined	ton	38	0	0	to	40	0	0
Permanganate	lb.	0	0	10	to	0	0	10½
Prussiate, red	lb.	0	2	10	to	0	3	0
Prussiate, yellow	lb.	0	1	0	to	0	1	1
Sulphate, 90%	ton	10	0	0	to	10	10	0
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	25	0	0	to	25	10	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4½
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3	to	0	0	3½
Caustic, 70%	ton	17	10	0	to	18	0	0
Caustic, 76%	ton	18	10	0	to	19	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	27	10	0	to	28	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	6	to	0	0	6½
Sulphide, crystals	ton	8	10	0	to	9	0	0
Sulphide, solid, 60–62 %	ton	14	10	0	to	15	10	0
Sulphite, cryst.	ton	11	10	0	to	12	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	50	0	0	to	55	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	0	0	to	11	10	0
Roll	ton	9	15	0	to	10	10	0
Tartar emetic	lb.	0	0	11½	to	0	1	0
Tin perchloride, 33%	lb.	0	1	1	to	0	1	2
Perchloride, solid	lb.	0	1	3	to	0	1	4
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	20	0	0	to	21	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	42	0	0	to	45	0	0
Dust, 90%	ton	50	0	0	to	55	0	0
Sulphate	ton	15	0	0	to	16	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	3	to	0	3	6
Acetanilid	lb.	0	1	6	to	0	1	9
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	6	to	0	2	9
Salicylic, B.P.	lb.	0	2	2	to	0	2	4
Tannic, leviss	lb.	0	3	2	to	0	3	4
Amidol	lb.	0	7	9	to	0	8	3
Amidopyrin	lb.	0	12	0	to	0	12	6
Ammon ichthosulphonate	lb	0	1	10	to	0	2	0
Barbitone	lb.	0	16	6	to	0	17	0
Beta naphthol resublimed	lb	0	2	0	to	0	2	3
Bromide of ammonia	lb.	0	0	7	to	0	0	7½
Potash	lb.	0	0	6	to	0	0	6½
Soda	lb.	0	0	7	to	0	0	7½
Caffeine, pure	lb.	0	10	9	to	0	11	0
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	1	9	to	0	2	0
Calomel	lb.	0	3	9	to	0	4	0
Chloral hydrate	lb.	0	4	0	to	0	4	3
Cocaine alkaloid	oz.	0	19	6	to	1	0	0
Hydrochloride	oz.	0	16	9	to	0	17	3
Corrosive sublimate	lb.	0	3	3	to	0	3	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	2	8	to	0	2	10
B.P. (75–80% eucalyptol)	lb.	0	2	9	to	0	2	11
Guaiacol carbonate	lb.	0	9	6	to	0	10	0
Liquid	lb.	0	8	9	to	0	9	3
Pure crystals	lb.	0	9	3	to	0	9	9
Hexamine	lb.	0	3	10	to	0	4	0
Hydroquinone	lb.	0	3	6	to	0	4	0
Lanoline anhydrous	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo	lb.	0	17	6	to	0	19	0
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	8	to	0	3	2
Metol	lb.	0	9	0	to	0	10	0
Milk sugar	cwt.	4	2	6	to	4	10	0
Paraldehyde	lb.	0	1	5	to	0	1	6
Phenacetin	lb.	0	6	0	to	0	6	3
Phenazone	lb.	0	8	3	to	0	8	6
Phenolphthalein	lb.	0	6	9	to	0	7	0
Potassium sulpho guaiacolate	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.	oz.	0	2	3	to		—	

	Per	£	s.	d.		£	s.	d.
Resorcin, medicinal	lb.	0	5	6	to	0	5	9
Salicylate of soda powder	lb.	0	2	6	to	0	2	9
Crystals	lb.	0	2	9	to	0	3	0
Salol	lb.	0	3	0	to	0	3	6
Soda Benzoate	lb.	0	2	4	to	0	2	6
Sulphonal	lb.	0	14	0	to	0	14	6
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	11	0	to	0	11	6
Soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	3	0	to	1	4	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6½	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9	to	0	0	9½
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	2	6	to	0	2	9
Benzidine, base	lb.	0	4	9	to	0	5	0
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	6	to	0	1	7
Dimethylaniline	lb.	0	2	9	to	0	3	0
Diphenylamine	lb.	0	3	6	to	0	3	9
H-Acid	lb.	0	4	9	to	0	5	0
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	8	6	to	0	9	6
Naphthionic acid, crude	lb.	0	2	6	to	0	2	8
Naphthionate of Soda	lb.	0	2	6	to	0	2	8
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevill-Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	7	to	0	0	8
Nitronaphthalene	lb.	0	0	11½	to	0	1	0
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	9	to	0	0	10
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	6	to	0	5	9
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.		£	s.	d.
Anise	firmer, c.i.f. 1/9 spot	0	1	10
Bay		0	12	0
Bergamot	firmer	0	13	0
Cajaput		0	3	0
Camphor, white	per cwt.	4	0	0
Brown	,,	3	15	0
Cassia	c.i.f. 10/6 spot	0	11	0
Cedarwood		0	1	4½
Citronella (Ceylon)	nominal, firm and scarce c.i.f. 3/6 spot	0	4	0
(Java)	firm, c.i.f. 4/0 spot	0	4	2
Clove	firmer	0	8	0
Eucalyptus	firm	0	2	6
Geranium Bourbon	firm	1	12	0
Lavender	firm	1	2	0
Lavender spike	firm	0	2	9
Lemon		0	2	11
Lemongrass	per oz.	0	0	2½
Lime (distilled)		0	4	0
Orange sweet (Sicilian)		0	11	0
(West Indian)		0	9	0
Palmarosa		1	3	0
Peppermint (American)		0	15	0
Mint (dementholised Japanese)		0	12	0
Patchouli		1	10	0
Otto of Rose	per oz.	1	15	0
Rosemary		0	1	7
Sandalwood		1	6	0
Sassafras		0	6	6
Thyme	2/6 to	0	8	0
Synthetics.				
Benzyl acetate	per lb.	0	3	0
Benzoate	,,	0	3	0
Citral	,,	0	10	0
Coumarine	,,	0	18	6
Heliotropine	,,	0	8	0
Ionone	,,	1	5	0
Linalyl acetate	,,	1	2	6
Methyl salicylate	firmer	0	2	9
Musk xylol		0	11	0
Terpeniol		0	3	0

A Chemical Waste Heap

At Bury on Friday, October 5, an inquiry was held into the death of George Morse, aged 56, of Leeds, who was said to be the foreman in charge of the men engaged on the trenching work at the Warth chemical waste heap, Warth Fold, Bury, where three men were fatally poisoned by fumes in July last. Giving evidence, Harold Kay, with whom Morse had lodged for about twelve months, said that on various occasions Morse had complained of getting a mouthful of sulphur fumes. George Morse, junior, said that his father died on October 1, and a certificate was given as to the cause of death. Arrangements were made for the funeral to take place on October 6, but, on account of a letter which witness had received and other information, he was not satisfied as to the cause of death and communicated with the police. Dr. A. P. Nuttall, who had made a post-mortem examination, expressed the opinion that death was due to acute pneumonia. He found no trace of poison by sulphuretted hydrogen in the body. A verdict of "Death from natural causes" was returned, the Coroner deciding that there was no connection between the occurrence in July and the death of Morse.

Canadian Dye Imports

Imports of dyeing and tanning materials into Canada during July were valued as follows: From Britain, $14,599; United States, $246,740; other countries, $88,672; total, $350,011; compared with imports from Britain, in July, 1922, $16,402; United States, $207,925; other countries, $40,588; total, $264,815. Imports of aniline and coal-tar dyes included in the above were: From Britain, 24,661 lb., value $9,657; United States, 134,202 lb., value $82,264; Germany, 54,908 lb., value $33,938; Netherlands, 8,759 lb., value $9,165; Switzerland, 38,443 lb., value $27,455; total 260,973 lb., value $162,479; compared with imports in July, 1922: From Britain of 37,890 lb., value $15,470; United States, 167,968 lb., value $98,519; Germany, 11,215 lb., value $14,748; Netherlands, 8,857 lb., value $9,405; Sweden, 1,600 lb., value $1,480; Switzerland, 13,199 lb., value $13,610; other countries, 2,205 lb., value $308. Total 242,934 lb., value $153,555.

The Preservation of Iron and Timber

Since 1916 a series of investigations into the deterioration of structures of timber, metal and concrete in sea-water has been undertaken by a Committee of the Institution of Civil Engineers with the aid of grants from the Department of Scientific and Industrial Research. The First Report of the Committee was published in 1920, and the Second (Interim) Report in 1922; a further Interim Report (published by H.M. Stationery Office, 3s. net) has now been prepared dealing with subsequent work.

The contents of the Report include the creosoting and impregnation of timbers; the protection of iron and steel from corrosion by preservative coatings; and the influence of strain upon the incorrodibility of iron and steel.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, October 11, 1923.

THE position of the heavy chemical market remains practically unchanged. Inquiries are fairly plentiful, but the actual number of orders booked leaves much to be desired.

Numerous Continental offers continue to be received, and prices quoted are on about a level with last week's figures.

Industrial Chemicals

ACID, ACETIC.—Glacial, 98/100%, £60 to £65 per ton in casks; 80% pure, £51 to £53 per ton; 80% technical, £47 to £48 per ton, c.i.f. U.K. ports, duty free.

ACID BORACIC.—Crystals or granulated, £48 per ton; powdered, £50 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC, Ice Crystals.—Price unchanged at about 1s. 2d. per lb. Moderate inquiry, mostly for export.

ACID CITRIC.—Inclined to be lower at about 1s. 5d. per lb., less 5%.

ACID FORMIC 85%.—Unchanged at about £49 per ton, ex store.

ACID HYDROCHLORIC.—In little demand. Price, 6s. 6d. per carboy, ex works.

ACID NITRIC 80%.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Unchanged at about 6d. per lb., ex store.

ACID SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC.—B.P. crystals, quoted 1s. 1d. per lb., less 5% ex store, spot delivery. Offered from Continent at 1s. 0½d. per lb., less 5% c.i.f. U.K. ports.

ALUMNIA, SULPHATE.—Quoted 14/15% £8 10s. per ton; 17/18% £10 10s. per ton, c.i.f. U.K. ports.

ALUM, CHROME.—Price about £24 per ton, ex store, spot delivery. Moderate export inquiry.

ALUM, POTASH (Lump).—Offered from the Continent at about £9 15s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Unchanged at about 1s. 5½d. per lb., ex station. Quoted 1s. 4½d. per lb., f.o.b. U.K. port for export.

AMMONIA CARBONATE.—Lump, 4d. per lb.; ground, 4¼d. per lb., delivered.

AMMONIA LIQUID 880°.—Offered at 3¼d. per lb., ex station. Containers extra.

AMMONIA MURIATE.—Grey galvanisers' quality. Unchanged at £31 to £32 per ton. Fine white crystals offered at £23 15s. per ton, c.i.f. U.K. ports. Spot lots about £26 per ton, ex store.

AMMONIA SULPHATE.—25¼% material, £12 19s. 6d. per ton; 25¾% neutral quality, £14 2s. 6d. per ton, ex works, October delivery.

ARSENIC, WHITE POWDERED.—In very little demand. Spot lots now offered at about £67 per ton, ex store.

BARIUM CARBONATE, 98/100%.—Price about £14 per ton, ex wharf, early delivery.

BARIUM CHLORIDE, 98/100%.—Spot lots on offer at about £14 per ton, ex store.

BARYTES.—Finest white English unchanged at £5 5s. per ton, ex works. Good quality continental material offered at £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots, £11 5s. per ton, ex station. contracts, 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystal, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations. Minimum ton lots.

CALCIUM CHLORIDE.—English material, £5 12s. 6d. per ton, ex station. Offered for export at about £4 10s. per ton, f.o.b. U.K. port.

COPPERAS, GREEN.—Moderate inquiry. Export quoted £2 2s. 6d. per ton, f.o.b. U.K. port.

COPPER SULPHATE.—Quoted £25 12s. 6d. per ton, less 5% f.o.b. U.K. port.

FORMALDEHYDE, 40%.—Spot material quoted £68 per ton, ex wharf. Offered for early delivery at £63 per ton, ex wharf.

GLAUBER SALTS.—Fine white crystals on offer at £3 5s. per ton, ex quay.

LEAD, RED.—English manufacturers' price unchanged at £40 per ton, carriage paid U.K. stations. Continental material, about £35 15s. per ton, ex store, spot delivery.

LEAD, ACETATE.—White crystals unchanged at about £41 10s. per ton, ex wharf, spot delivery. Offered from continent at £38 10s. per ton, c.i.f. U.K. ports.

MAGNESITE CALCINED.—Finest English ground quoted £8 per ton, ex station. Offered from the continent at about £7 5s. per ton, c.i.f. U.K. ports.

MAGNESIUM CHLORIDE.—Quoted £2 10s. per ton, c.i.f. U.K. ports, prompt shipment. Spot lots offered at about £3 2s. 6d. per ton, ex store.

MAGNESIUM SULPHATE (EPSOM SALTS).—B.P. quality quoted £6 5s. per ton, ex station.

POTASH, CAUSTIC, 88/92%.—Unchanged at about £32 per ton, ex store, spot delivery. Continental offers of about £29 per ton, c.i.f. U.K. port.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb., delivered.

POTASSIUM CARBONATE.—96/98%, price about £29 per ton, ex store, spot delivery. Offered from continent at about £27 per ton, c.i.f. U.K. ports. 90/94% quality quoted £24 5s. per ton, ex wharf, early delivery.

POTASH CHLORATE.—Unchanged at about 3d. per lb.

POTASSIUM NITRATE (Saltpetre).—Spot lots quoted £31 per ton, ex store.

POTASSIUM PERMANGANATE.—B.P. crystals. Inclined to be lower at about 9¾d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (Yellow).—Price remains unchanged at about 1s. 1d. per lb., ex store, spot delivery.

SODA, CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62%, £19 2s. 6d. per ton; 98/99%, powdered, £22 15s. per ton. All ex station spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Spot lots offered at £24 15s. per ton, ex store. Offered from Continent at about £23 12s. 6d. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined Recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

SODIUM CARBONATE—Soda Crystals, £5 to £5 5s. per ton, ex quay or station; Alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Continental quotations inclined to be higher at about £9 5s. per ton, c.i.f. U.K. ports. Spot lots on offer at £10 per ton, ex store. Pea crystals quoted £14 5s. per ton, ex store, spot delivery.

SODIUM NITRATE.—Refined 96/98% quality quoted £13 5s. per ton, f.o.r. or f.o.b. U.K. port.

SODIUM NITRITE 100%.—In little demand. Price £26 10s. to £28 10s. per ton according to quantity, f.o.b. U.K. port.

SODIUM PRUSSIATE (Yellow).—In little demand. Price about 6d. per lb., ex store.

SODIUM SULPHATE (Saltcake).—£4 per ton, ex station for home consumption. Good export inquiry.

SODIUM SULPHIDE.—60/65% solid £14 per ton ex station. Broken £1 per ton more. 31/34% crystals £8 15s. per ton, ex station.

SULPHUR, Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

TIN, CRYSTALS.—Unchanged at 1s. 4d. per lb.

ZINC CHLORIDE.—Moderate export inquiry. Quoted £26 per ton, f.o.b. U.K. port.

ZINC SULPHATE.—Spot lots now quoted £14 15s. per ton, ex store.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANTHRA QUINONE.—Small export inquiry. Price, 2s. 6d. per lb., f.o.b.

BETA NAPHTHOL.—Good export inquiries. Price 1s. 1d. per lb., f.o.b.

CASSELLA ACID F.—Home inquiry. Price 10s. per lb., 100 per cent. basis.
DINITRONAPHTHALENE.—Supplies are offered at 1s. 4d.
DINITROTOLUOL.—Poor demand. Price 1s. 3¼d.
GAMMA ACID.—Small export inquiries. Price, 13s. per lb., 100 per cent. basis, f.o.b.
" H " ACID.—Moderate demand for export. Price 4s. 9d. per lb., 100 per cent. basis.
LAURENTS ACID.—Limited demand. Price 3s. 2d. per lb., f.o.b.
METANITRANILINE.—Small export inquiry. Price 5s. 6d. per lb., f.o.b.
NEVILLE AND WINTHER ACID.—Small export inquiries. Price 6s. per lb., 100 per cent. basis, f.o.b.
PARA-AMIDO-ACETANILIDE.—Export inquiry. Price 5s. 3d., 100 per cent. basis.
PARA-AMIDO-PHENOL BASE.—Small export inquiry. Price quoted, 9s. 9d. per lb., 100 per cent. basis.
PURE TOLUOL.—Market weak. Supplies offered at 1s. 10d. per gallon, delivered.
TOLIDINE BASE.—Some export inquiries. Price, 7s. per lb., 100 per cent. basis.
TOLIDINE HYDROCHLORIDE.—Some export inquiry. Price 7s. per lb., f.o.b.

Catalogues Received

EDWARD G. HERBERT, LTD.—The " Rapidor," an interesting metal saw, with a blade of high-speed 18 per cent. tungsten steel, is described in a booklet issued by this firm of Atlas Works, Levenshulme, Manchester. The blade is used with special sawing and sharpening machines, and, owing to its special construction, its high-speed cutting powers improve considerably with use.

THE PREMIER ELECTRIC WELDING CO., LTD.—The " Premier " Handbook for Electric Welders is an excellently printed and produced booklet which contains much useful information on the practice of electric welding, with special reference to the furnaces, electrodes and other essentials produced by the firm. The booklet will be sent to readers interested on application to the firm at Abbey Wood, London, S.E.2.

BRITISH DRUG HOUSES, LTD.—The latest price list issued by this firm contains over two thousand organic and inorganic chemicals for research and analysis purposes, in addition to special lists of analytical reagents, standard solutions, indicators and other necessities for well-equipped laboratories. A speciality is made of apparatus for pH. determination. The list will be forwarded on application to the firm at Graham Street, City Road, London, N.1.

INTERNATIONAL ELECTROLYTIC PLANT CO., LTD.—A booklet issued by this firm from the City Electricity Works, Chester, contains an illustrated description of a plant at the Erith Oil Works, Kent, recently installed by the company for the production of hydrogen electrolytically for hydrogenation of oils. In addition there is a description of the Knowles electrolytic cell and a considerable amount of useful information on the production of oxygen and hydrogen gas.

PLAUSON'S MILL AND FILTER PRESS, LTD.—The latest catalogue issued by this firm will be sent to readers who are interested on application to 17, Waterloo Place, London, S.W.1. The catalogue contains forty pages illustrating and describing various patterns of the Plauson colloid mill, and shows installations of these instruments in use in the works of Mather and Platt, Ltd., Manchester. In addition, micro-photographs are given showing various substances before and after treatment in the mill. These include illustrations of lithopone, zinc white, phosphates, carbon black, kieselguhr and china clay.

Silica Deposits in U.S.A.

A STUDY of the mining, preparation and uses of silicia will be undertaken by the American Department of the Interior, through the Bureau of Mines. The investigation will cover the range of quartzite, sandstone, sands of all kinds, tripoli, diatomaceous earth, flint and rottenstone. The investigation will consist of library research, correspondence and field study, leading to possible findings and recommendations for improvement in efficiency, safety, and quality of products.

The Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, October 11, 1923.

CHEMICAL traders here continue to meet with a quiet though steady business, and prices generally have been maintained, the few fluctuations that have occurred during the past week having been of comparatively little importance. Home trade buying, everything considered, is fairly active in the principal lines of " heavies," and on foreign account a quietly steady demand, chiefly restricted to the Dominion markets, is being met with.

Heavy Chemicals

Bleaching powder is steady at £11 5s. per ton for home consumption; the domestic demand is maintained at its recent level, while export trade also is reasonably brisk. Prussiate of soda is still only in moderate request, with current quotations ranging from 5¾d. to 6d. per lb. Caustic soda is in demand on home and foreign account, and prices are firm at from £16 17s. 6d. for 60 per cent. to £19 7s. 6d. per ton for 76-77 per cent. material. Hyposulphite of soda is a quiet section; photographic crystals are offered at £14 10s. to £15, and commercial quality at about £9 10s. per ton. Saltcake is unchanged at £4 10s. per ton; export business is active, with home buying on a small scale. Glauber salts keep quiet at £4 per ton. The demand for sodium sulphide is only moderate, with 60-65 per cent. concentrated offering at £14 10s. and crystals at £9 per ton. Bicarbonate of soda continues to attract a fair amount of buying interest at £10 10s. per ton delivered to home users. Prompt supplies of nitrite of soda are scarce and prices firm at £26 10s. per ton. Alkali is firm and in steady demand at £7 10s. per ton for 58 per cent. material. Phosphate of soda is dull but unchanged at £15 per ton. Soda crystals are rather quiet at £5 5s. per ton delivered. Bichromate of soda keeps steady and in fair request at 4¼d. per lb. Acetate of soda is only moderately active, but with prompt offerings rather short prices are fully held at the recent level of £24 per ton. Chlorate of soda is firm at 2¾d. per lb., a steady volume of business being done.

Both caustic and carbonate of potash are moderately active, with prices maintained; to-day's quotation for caustic is on the basis of £30 per ton for 88-90 per cent. material, and for carbonate £28 to £29 is asked for 90 per cent. quality and £30 per ton for 96 per cent. Chlorate of potash meets with a quietly steady demand at round 3d. per lb. Permanganate is still quiet, the prices are unchanged at 9d. to 9¼d. per lb. Bichromate of potash is being steadily called for at 5¾d. per lb. Yellow prussiate of potash is inactive at 1s. to 1s. 1d. per lb.

Arsenic, Cornish white powdered, is offering at about £67 per ton, Manchester, but the demand is only moderate compared with the volume of business that was being put through a month or two ago. Sulphate of copper still shows little sign of improvement, either in home or foreign demand, and prices are between £25 10s. to £26 per ton, f.o.b. Epsom salts are rather easier; commercial is offered at £4 to £4 10s., and magnesium sulphate, B.P., at £6 per ton. Sugar of lead is firmly maintained at £41 for white and £42 to £43 per ton for brown, offers being comparatively scarce for early delivery. Acetate of lime is also steady at £22 for grey and round £12 10s. per ton for brown. Nitrate of lead is inactive though unchanged at £42 per ton.

Acids and Tar Products

Tartaric acid is attracting little attention, with quotations round 1s. 2d. per lb. Citric acid is in much the same position and prices are weak at 1s. 5d. to 1s. 6d. per lb. Acetic acid is in fair demand though a shade easier at £46 10s. to £47 for 80 per cent. technical and £65 per ton for glacial. Oxalic acid is inactive at 5⅞d. per lb.

Pitch keeps rather firm at £6 to £6 10s. per ton, Manchester, with a fair amount of business being booked. Creosote oil is steady but only in small demand at 8½d. per gallon. Solvent naphtha is quiet at 1s. 3d. to 1s. 3½d. per gallon. Carbolic acid is very firm at 3s. 6d. to 3s. 8d. per gallon for crude, and 1s. 2½d. per lb. for crystals, offers being short. Naphthalenes are steady at £19 to £20 per ton for refined and £6 to £12 per ton for crude.

Company News

ARIZONA COPPER CO.—A dividend of 1s. per share, free of tax, is announced on the ordinary shares.

THE INTERNATIONAL NICKEL CO.—A quarterly dividend of 12 per cent. on the preferred stock has been declared, payable on November 1.

FORSTER'S GLASS CO.—The profit for the year to March 31 last amounted to £2,287, reducing the debit balance to be carried forward to £29,292.

NOBEL INDUSTRIES, LTD.—The transfer books for the 5½ per cent. first mortgage debenture stock will be closed from October 18 to October 31, inclusive.

CANADA CEMENT CO.—A dividend of $1½ per share, less tax, is announced on the common shares, payable on October 16. A year ago the dividend was the same.

THE LOA NITRATE CO.—The transfer books of the 6½ per cent. first mortgage registered debentures will be closed from October 17 to October 30, both days inclusive.

ANTOFAGASTA (CHILI) AND BOLIVIA RAILWAY CO.—The directors have declared an interim dividend of 3 per cent. on the ordinary stock. Last year no interim dividend was paid on the ordinary stock.

CANADIAN EXPLOSIVES.—A dividend is announced at the rate of 1¾ per cent. for the quarter to September 30 last, on the 7 per cent. cumulative preferred shares, payable on October 15 to holders registered on September 29.

ALIANZA NITRATE CO., LTD.—The directors have declared an interim dividend of 20 per cent. on account of profits for the current year. Warrants, less tax, will be posted on November 8 to registered holders in the United Kingdom.

THE ASSOCIATED PORTLAND CEMENT MANUFACTURERS, LTD.—The register of members and transfer books of the 5 per cent. second debenture stock will be closed from October 19 to November 1, both days inclusive, for the preparation of the half-yearly interest warrants.

THE WALL PAPER MANUFACTURERS, LTD.—The preference share registers of the company will be closed from October 17 to October 31, both days inclusive, for the payment of the preference dividend for the half-year ending August 31. Warrants will be posted on October 31.

RELIANCE FUEL CO.—The directors have informed the shareholders that they have decided not to publish accounts to December 31 last, but to have a further statement prepared for the nine months ended September 30, so that completed accounts for the two periods may be submitted to shareholders early in the New Year.

BRYANT AND MAY, LTD.—The directors announce a dividend at the rate of 7 per cent., less tax, for the half-year to September 30 last, on the preference shares, and an interim dividend of 4 per cent., free of tax, on the ordinary and partnership shares for the same period, payable on November 1. The transfer books of the preference and ordinary shares were closed yesterday, October 12, and will remain closed until October 20.

RIO TINTO CO.—Out of the estimated profits of the year 1923 the directors have declared an interim dividend of 10s. per share on the ordinary shares. The directors have also declared the usual interim dividend, for the six months to June 30 last, of 2s. 6d. per share on the 5 per cent. preference shares. Both the dividends are payable on and after November 1 next, less English income tax. The share transfer books will be closed from October 13 to 31, inclusive.

Australian Mining Deal

A MESSAGE from Melbourne states that an agreement is to be signed, subject to shareholders' confirmation, by which North Broken Hill (Limited) will acquire the assets of British Australian Broken Hill (Limited) at a purchase price of 100,000 shares in the North Broken Hill, payment of £140,000 sterling in cash, and the surrender to the British Company's liquidator of 150,000 shares in the British Company, which North Broken Hill owns. The purchase is on the basis that the British Australian Company's ore reserves above the twelfth level stand approximately at 824,000 tons.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

AMMONIUM SULPHATE.—A commission agent of Barcelona is desirous of securing the representation of British exporters of ammonium sulphate. Reference No. 402.

HEAVY CHEMICALS, FERTILISERS, OILS.—A firm in Naples desire to secure the representation of British firms for the sale of heavy chemicals, including caustic soda, potassium and sodium bichromates, chrome alum, bicarbonate of soda, ammonium carbonate, ammonium sulphate, also whale and fish oils, tallow, castor oil seeds, and shellac. Reference No. 397.

SPICES, SACCHARIN, ISINGLASS.—A firm of commission agents in Helsingfors desire to secure the representation for Finland of British exporters of spices, saccharin, isinglass, vanillin, coumarin and dulcin. Reference No. 394.

SURGICAL AND DENTAL INSTRUMENTS, DRUG SUNDRIES.—A firm of manufacturers' agents in Winnipeg desire to secure the representation, on a commission basis, of British manufacturers of surgical and dental instruments, drug sundries, toilet preparations and perfumes. Reference No. 384.

Tariff Changes

GERMANY.—Substances in the following list are still subject to export duty:—

Salt (chloride of soda) and all substances from which salt can be extracted; mother lye, fur stone and articles of rock salt, *Dornstein*; soda, natural and artificial, bleaching soda; scale preventives containing soda; bicarbonate of soda; caustic soda, solid or liquid; artificial alumina; artificial ice stone (cryolith, etc.), hydroxide of aluminium, artificial, refined bauxite; nitrate of ammonia (ammonia saltpetre), not in shells or capsules; nitrate of soda (Chile saltpetre); acetate and pyrolignite of lime; sulphate of ammonia; gold chloride, gold salt and other salts and combinations of gold not elsewhere mentioned; nitrate of lime and fertilisers not elsewhere mentioned in the Statistical Index; silver salts and combinations not elsewhere mentioned in the Statistical Index, *e.g.*, silver bromide, silver chromate, silver nitrate.

Chalk, white, washed, also raw chalk in dust or finely pulversed in any other manner; artificial guano (fish, meat, blood, etc., guano); animal sinew meal; animal manure, ground (poudrette); bone ash, Thomas' phosphate meal and phosphatic manures treated with acids (superphosphates) combined or not with other materials; also substances dutiable in themselves and used as manures under control.

Tars and pitches (coal, wood, etc.), except oil gas and water gas tar; coal tar oils, heavy (*e.g.*, anthracene, carbolic oil, creosote oil, asphalt naphtha) and light (*e.g.*, benzol, cumol, toluol, xylol); so-called carburet of hydrogen (*Kohlenwasserstoff*).

Spirit and methylated spirit; other spirits except liqueurs; mixtures of alcohol with ether and solutions of ether in alcohol—all these in bottles, jars and similar receptacles.

In addition a long list of earths and ores is also still subject to duty, including china clay, kieselguhr, gypsum, magnesite, phosphate of lime, pyrites, etc.

Linseed Oil for South Africa

HIS Majesty's Senior Trade Commissioner in South Africa reports that the Tender Board of the South African Railway Headquarters Offices at Johannesburg, are calling for tenders for the supply and delivery "ex ship" of raw and double boiled linseed oil for the six months ending June 30, 1924. (Tender No. 476.) A copy of the specification, general conditions of tender, etc., may be seen at the Department of Overseas Trade (Room 53), 35, Old Queen Street, London, S.W.1. Reference No. 12290/E.D./C.C./2/A.

THE BRITISH ALIZARINE COMPANY LTD.

Manchester London Glasgow

Manufacturers of Alizarine Dyestuffs

ALIZARINE RED (all shades)

ALIZARINE BLUES (soluble and insoluble)

ALIZARINE BORDEAUX

ALIZARINE CYANINE

ALIZARINE GREEN (soluble and insoluble)

ALIZARINE ORANGE

ALIZARINE RED S. POWDER

ALIZARINE BLUE BLACK

ALIZARINE (MADDER) LAKES (of all qualities)

ALIZARINE MAROON

ALIZUROL GREEN (Viridine)

ANTHRACENE BROWN

ALIZANTHRENE BLUE

ALIZANTHRENE BROWN

ALIZANTHRENE YELLOW

Other fast colours of this series in course of preparation

Anthraquinone, Silver Salt and all intermediates of this series

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CHROME TANNING and other Chrome Compounds

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TELEGRAMS
BRITALIZ MANCHESTER
BRITALIZ LONDON
BRITALIZ GLASGOW

All communications should be addressed to
The British Alizarine Co., Ltd.
Trafford Park, Manchester

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

LION LAUNDRY, Cheriton, Folkestone, laundry proprietors (C.C., 13/10/23.) £10 15s. 10d. September 13.

MARKHAM, Stanley Raymond, 152, Green Lanes, Clissold Park, laundry proprietor. (C.C., 13/10/23.) £36 17s. 8d. September 5th.

RADIUM AND CHEMICAL CO., LTD., 145, Moorgate, E.C., manufacturers. (C.C., 13/10/23.) £21 18s. 6d. July 27.

RUDRUM, R. C., Friars Croft Laundry, Friars Croft Lane, Wymondham, laundry proprietor. (C.C., 13/10/23.) £27 0s. 8d. September 11.

SNOW WHITE HAND LAUNDRY, 83, Montgomery Street, Hove, laundrymen. (C.C., 13/10/23.) £13 8s. 10d. September 8.

Bills of Sale

BRANSBERG, Solomon, 160, Rye Hill, Newcastle-on-Tyne, dyer and cleaner. (B.S., 13/10/23.(October 4. £60.

LEA, John, jun., 9, Corinthian Avenue, Stoneycroft, Liverpool, analytical chemist. (B.S., 13/10/23.) October 2. £60.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

CLEMENT AND JOHNSON, LTD., London, W.C., chemists. (M., 13/10/23.) Registered September 25, £100, £100, £100 and £300 debentures part of £60,000; general charge. *£38,700. January 12, 1923.

EGYPTIAN CENTRAL OILFIELDS, LTD., London, E.C. (M., 13/10/23.) Registered October 1, £3,000 debentures balance of £20,000; general charge. *£15,000. May 29, 1923.

HYGIENIC LAUNDRY (LEEDS), LTD. (M., 13/10/23.) Registered September 26, £10,000 mortgage, to building society; charged on properties in Upper Wortley. *Nil. December 28, 1922.

MORRIS (P.) AND CO., LTD., Liverpool, oil and paint manufacturers. (M., 13/10/23.) Registered September 24, £3,500 mortgage, to J. L. Williams, 25, Water Street, Liverpool, solicitor, and another; charged on 6, Manchester Street and 1, Preston, Street, Liverpool. *Nil. May 29, 1923.

YETTA SOAP AND OIL CO., LTD., Twickenham. (M., 13/10/23.) Registered September 25, £200 debenture, to H. Duckworth, Cromwell House, Twickenham, manager; general charge. *Nil. April 23, 1923.

Satisfactions

MARLEY HILL CHEMICAL CO., LTD. (MS., 13/10/23.) Satisfaction registered October 1, £500, part of amount registered January 4, 1921.

SHAW (E. P.) AND CO., LTD., Wakefield, mineral water manufacturers and chemists. (M.S., 13/10/23.) Satisfaction registered October 3, £3,918 14s. 5d., part of amount outstanding July 1, 1908; and £300, part of amount registered September 2, 1905.

London Gazette

Company Winding Up Voluntarily

SMARTNESS, LTD. (C.W.U.V., 13/10/23.) Percy Brandon 20c, Trebovir Road, Earl's Court, S.W.5, appointed liquidator.

Bankruptcy Information

EGELNICK, Stanley Sidney, lately carrying on business at 19, Nicholas Street, Stepney, London, as STANLEY SIDNEY, perfumer and chemists' sundriesman. (R.O., 13/10/23.) Receiving order, September 28. Creditor's petition. First meeting, October 16, 12 noon; and public examination, January 16, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

STANSFIELD, John Lord, Boothfold, Waterfoot, Bacup, in the county of Lancaster, chemical manufacturer. (R.O., 13/10/23.) Receiving order, October 2. Creditor's petition.

Partnership Dissolved

BUCKLE, CROSSLEY AND CO. (John William BUCKLE and George Herbert BEANLAND), piece dyers and finishers, Victoria Dyeworks, Cemetery Road, Bradford, by mutual consent as from December 31, 1922. Debts received and paid by J. W. Buckle.

Winding-Up Petition

SCHOLES (JOHN R.) AND CO., LTD. (W.U.P., 13/10/23.) A petition has been presented and is to be heard at the Court House, Quay Street, Manchester, on Tuesday, October 23, at 10.15 a.m.

New Companies Registered

LEICESTER PAPER STAINING CO., LTD., The Mills, Birstall, Leicester. Manufacturers of and dealers in wall papers and wall hangings of all kinds; dealers in salts, alkalis, acids, and chemical materials, etc. Nominal capital, £5,000 in £1 shares.

MARSDENS (CLAYTON), LTD., Clayton Lane, Clayton, near Manchester. Dyers, bleachers, etc., manufacturers of and dealers in vitriol and chemicals of all kinds. Nominal capital, £40,000 in £1 shares.

ROSSENDALE BUTCHERS' CO., LTD., 3, Burnley Road, Waterfoot, Lancs. Manufacturers and refiners of glycerine and other oils, soap boilers and makers, glue, size and manure manufacturers, etc. Nominal capital, £1,000 in £1 shares.

Scottish Chemical Company's Disclaimer

IN the Commercial Intelligence published in THE CHEMICAL AGE of September 29 (p. 358) an announcement of the appointment of a liquidator to the Western Chemical Co., Ltd., appeared under the head "Companies winding up voluntarily."

We are informed by the Western Chemical Co. (Paisley), Ltd., Sandyford Works, Paisley, that they have no connection with the company referred to and that the announcement must not be taken as in any way referring to the Paisley company.

Improved Volatilisation Process for Zinc-Lead Separation

IN connection with experimental work on modifications of chloride volatilisation process, on which the American Department of the Interior has for some time been engaged at the Intermountain experiment station of the Bureau of Mines, Salt Lake City, it is now announced that in several cases chlorides are left out of the ore entirely and oxides are volatilised. For mixed zinc-lead ores it is possible to so alter them by roasting that the volatile lead oxide can be removed from the ore by further raising the temperature, using a rotary kiln for this latter step of the work. Lead can be almost completely cleaned, and even some of the silver removed from roasted zinc concentrate containing the usual small amounts of lead. This has already been shown by tests on a semi-commercial scale. It is believed that not only can this method be used with possible profit by the zinc smelters, but that it is entitled to favourable consideration as a means of concentrating ore.